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A Revision of the Japanese Spiders of the Genus *Neoscona* (Araneae: Araneidae)

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谷川明男[1)]：日本産ヒメオニグモ属（クモ目：コガネグモ科）クモ類の再検討

Abstract Japanese spiders of the genus *Neoscona* are revised. Following eleven species are recognized to be occurring in Japan: *Neoscona theisi* (Walckenaer, 1841), *N. adianta* (Walckenaer, 1802), *N. amamiensis* sp. nov., *N. nautica* (L. Koch, 1875), *N. subpullata* (Bösenberg et Strand, 1906), *N. mellotteei* (Simon, 1895), *N. scylloides* (Bösenberg et Strand, 1906), *N. scylla* (Karsch, 1879), *N. minoriscylla* Yin *et al.*, 1990, *N. punctigera* (Doleschall, 1857) and *N. vigilans* (Blackwall, 1865).

The first araneologist who studied Japanese spiders of the genus *Neoscona* was Koch. In 1878, he described *Epeira opima* as a new species based on the specimen collected in Japan. Bösenberg and Strand (1906) placed it in the genus *Aranea* (= *Araneus*). On the other hand, they reported *Aranea punctigera vatia* (Thorell, 1877) from Saga, Japan. Yaginuma (1955) considered that *A. opima* and *A. punctigera* were conspecific and placed the former species in the genus *Neoscona*. In 1960, he moved the species again to the genus *Araneus*. Finally, he (1967) synonymized *Araneus opimus* with *A. lugubris* (Walckenaer, 1841).

Grasshoff (1980) re-identified the Japanese species, which was regarded as *A. lugubris*, with *Afraranea punctigera* (Doleschall, 1857). Then he (1986) treated *Afraranea* as the subgenus of the genus *Neoscona*. Yaginuma (1986a) used the specific name *punctigera*, but placed it in the genus *Araneus* and misspelled as *Araneus punctigera*. The species will be placed in the genus *Neoscona* in this paper.

The genus *Afraranea* was described by Archer (1951). He separated *Afraranea* from *Neoscona* by the shape of the median apophysis of the male palp and the shape of the scape of female epigynum. My judgement is that these differences are not good enough to establish the independent genus and *Afraranea* should be treated as a junior synonym of *Neoscona*.

In 1879, Karsch described *Epeira scylla* as a new species from Japan. Bösenberg and Strand (1906) placed it in the genus *Aranea* (= *Araneus*). Then Yaginuma (1955) transferred it to the genus *Neoscona*.

Simon (1895) described *Araneus mellotteei* from Yokohama, Japan. Yaginuma (1955) transferred it to the genus *Neoscona*.

Bösenberg and Strand (1906) described three new species, *Aranea subpullata, A.*

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scylloides, Meta doenitzi, and a new subspecies *Aranea adianta japonica*. Yaginuma (1955) placed them in the genus *Neoscona*. Then Yaginuma (1986b) synonymized *Neoscona doenitzi* with *N. adianta*.

Bösenberg and Strand (1906) recorded from Japan *Aranea nautica* (Walckenaer, 1841), which was transferred to the genus *Neoscona* by Petrunkevitch (1930). Yaginuma (1955) synonymized *Aranea koratsensis* described by Dönitz and Strand in Bösenberg and Strand (1906) with *Neoscona nautica*.

Yaginuma (1955) recorded *Neoscona rumpfi* (Thorell, 1878) and *N. theisi* (Walckenaer, 1841) from Japan. He (1986a) re-identified the former species with *Araneus rufofemoratus* (Simon, 1884). Grasshoff (1986) synonymized it with *Neoscona vigilans* (Blackwall, 1865).

In the summer of 1996, Mr. Akio Yasuda collected a unique female spider from Tsushima Island, Nagasaki Prefecture, Japan. I identified the spider with *Neoscona minoriscylla* Yin *et al*., 1990 described from China. A new species, which will be described in the present paper, was collected by me from Amami-oshima Island, Kagoshima Prefecture.

After examining many specimens from various parts of Japan, I recognized eleven species of the genus *Neoscona* occurring in this country. As mentioned above, these are nine known species, one newly recorded species, and one new species. Judging from the features of these species, especially those of male and female genital organs, they should be placed in the genus *Neoscona*. Refer to the following section for further details.

The type specimens designated in this paper are deposited in the collection of the Department of Zoology, National Science Museum, Tokyo (NSMT).

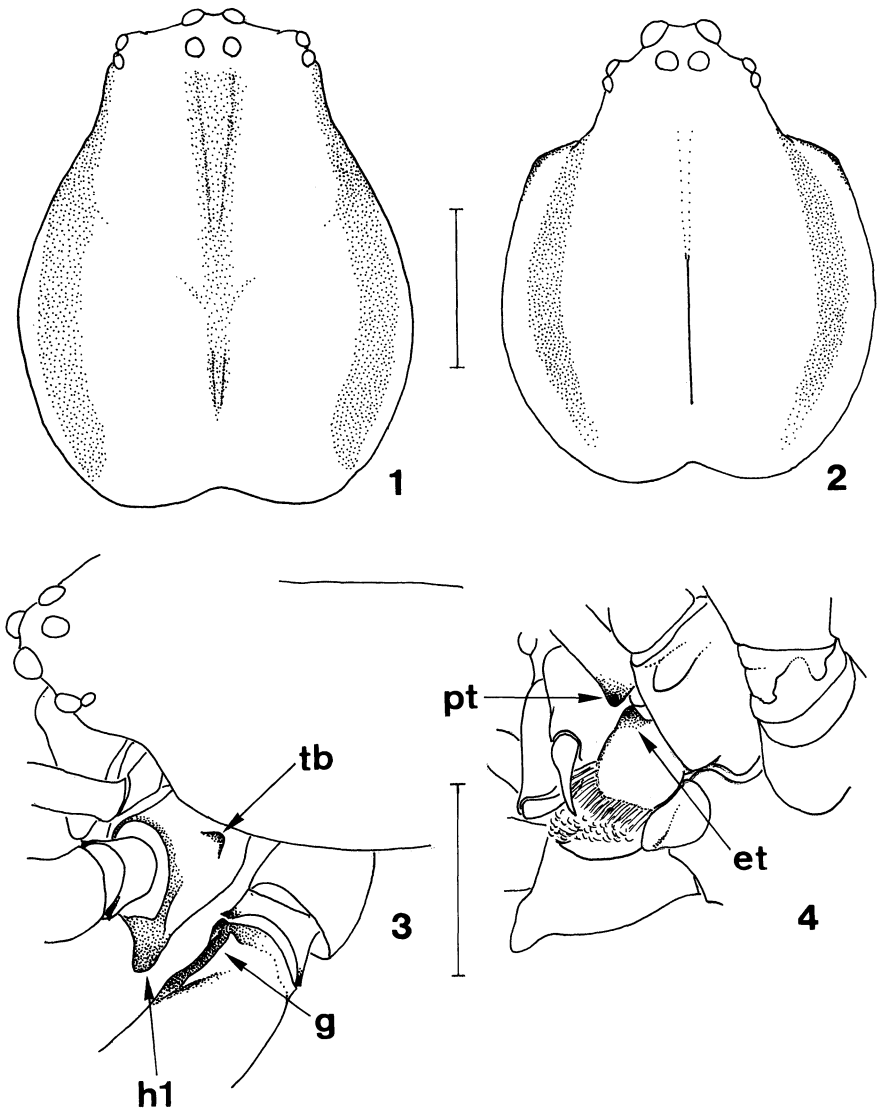
The following abbreviations are used in this paper; L: length, MOA: median ocular area, W: width, WA: anterior width, WP: posterior width.

Genus ***Neoscona*** Simon, 1864

Neoscona Simon 1864, p. 261. Type species: *Epeira arabesca* Walckenaer, 1841, designated by F. O. P.-Cambridge, 1904; Berman & Levi, 1971, p. 469; Grasshoff, 1986, p. 4.
Chinestela Chamberlin, 1924, p. 20.
Cubanella Franganillo, 1926, p. 14.
Neosconopsis Archer, 1951a, p. 3.
Afraranea Archer, 1951b, p. 21.

Diagnosis. The spiders of the genus *Neoscona* can be separated from those of the genus *Araneus* by the following points. Scape of epigynum smooth, not wrinkled, without flexibility (Figs. 11, 18). Thoracic groove longitudinal (Figs. 1-2), distinct in male (Fig. 2). Cymbium of the male palp situated ventrally (Figs. 16, 23). Conformation of male palpal sclerites is also characteristic.

Description. Carapace longer than wide; median ocular area wider than long or as wide as long, wider in front than behind; chelicera with 4 (rarely 3) promarginal and 3 (rarely 2 or 4) retromarginal teeth; labium wider than long; sternum longer than wide. Male 1st coxa with ventral hook and dorsal tubercle (Fig. 3, h1, tb), 2nd femur with groove (Fig. 3, g); 2nd tibia prolaterally with many strong spines (Figs. 14, 21, 28, 42, 57, 65, 79, 96, 103,), except *N. subpullata* (Fig. 49). Male endite with a lateral tooth (Fig. 4, et). Male palpal femur with tubercle at the basal part (Fig. 4, pt); tibia with two



Figs. 1–4. *Neoscona theisi* (Walckenaer, 1802). —— 1, Female carapace, dorsal view; 2, male carapace, dorsal view; 3, dorsal tubercle (tb) and ventral hook (h1) on male coxa I, and groove (g) on femur II; 4, basal tubercle on male palpal femur (pt) and lateral tooth on endite (et). (Female: NSMT-Ar 4062, male: NSMT-Ar 4065; scales: 0.25 mm.)

macrosetae. Abdomen longer than wide or as long as wide; female epigynum triangular, tongue-shaped, or elongated; scape of epigynum not wrinkled and without flexibility.

Key to the Japanese species

1. Male ..... 2.
— Female ..... 11.
2. Median apophysis without hook (Figs. 97, 104) ..... 3.
— Median apophysis with hook (Figs. 15, 22, 29, 43, 50, 59, 66, 80) ..... 4.
3. Tip of conductor bifurcated (Fig. 105, c) ..... *N. vigilans* (Blackwall, 1865).
— Tip of conductor not bifurcated (Fig. 98, c) ..... *N. punctigera* (Doleschall, 1857).
4. 4th coxa with hook (Fig. 58, h4) ..... 5.
— 4th coxa without hook ..... 6.
5. Tip of conductor bifurcated (Fig. 60, c) ..... *N. mellotteei* (Simon, 1895).
— Tip of conductor not bifurcated (Fig. 67, c) ..... *N. scylloides* (Bösenberg et Strand, 1906).
6. 2nd tibia prolaterally with several spines (almost same as 1st tibia) (Fig. 49) ..... *N. subpullata* (Bösenberg et Strand, 1906).
— 2nd tibia prolaterally with many spines (much more than 1st tibia) (Figs. 14, 21, 28, 42, 79) ..... 7.
7. 2nd tibia ventrally with a large spine at about middle (Fig. 42) ..... *N. nautica* (L. Koch, 1875).
— 2nd tibia without such a large spine at about middle (Figs. 14, 21, 28, 79) ..... 8.
8. Hook of median apophysis situated at distal half (Fig. 80) ..... *N. scylla* (Karsch, 1879).
— Hook of median apophysis situated at about middle (Figs. 15, 22, 29) ..... 9.
9. Terminal apophysis of palp minute (Fig. 16, ta) ..... *N. theisi* (Walckenaer, 1841).
— Terminal apophysis of palp not minute (Figs. 23, 30, ta) ..... 10.
10. Dorsum of abdomen with paired black spots, posteriorly fused in transversal pattern (Fig. 9) ..... *N. adianta* (Walckenaer, 1802).
— Dorsum of abdomen with dark colored V-shaped marking, without transversal pattern (Fig. 10) ..... *N. amamiensis* sp. nov.
11. Scape of epigynum, tongue shaped, long and flattened, distinctly separated from base (Figs. 93–94, 100–101) ..... 12.
— Scape of epigynum otherwise ..... 13.
12. Scape nearly as wide as distance between openings, openings with pointed lateral bulge (Fig. 102), lateral view of epigynum as in Fig. 101 ..... *N. vigilans* (Blackwall, 1865).
— Scape wider than distance between openings, without lateral bulge (Fig. 95), lateral view of epigynum as in Fig. 94 ..... *N. punctigera* (Doleschall, 1857).
13. Scape short and triangular, distinctly separated from the base (Fig. 46) ..... *N. subpullata* (Bosenberg et Strand, 1906).
— Scape otherwise ..... 14.
14. Epigynum quite wide at base, steeply narrowing to scape, openings with distinct lateral bulge (Fig. 83) ..... *N. minoriscylla* Yin *et al.*, 1990.
— Epigynum otherwise ..... 15.
15. Epigynum long and narrow (Figs. 54, 62, 76) ..... 16.
— Epigynum otherwise (Figs. 11, 18, 25, 39) ..... 18.
16. Dorsum of abdomen without green color, though markings much varied, in brownish color both in life and in alcohol (Figs. 70–75) ..... *N. scylla* (Karsch, 1879).

— Dorsum of abdomen green in life, yellow or white in alcohol, without markings (rarely with dark colored spot in the center) (Figs. 37-38) ..... 17.
17. Venter of abdomen brown, boundary line between green/yellow part and brown part distinctly visible in lateral view (Fig. 37) ..... *N. mellotteei* (Simon, 1895).
— Venter of abdomen green in life as well as dorsum, yellow or white in alcohol, anterior margin of abdomen bright yellow in life, indistinct in alcohol (Fig. 38) .. .. *N. scylloides* (Bösenberg et Strand, 1906).
18. Epigynum elongated triangle (Fig. 11), openings very small (Fig. 13, o); dorsum of abdomen as in Figs. 1-4 ..... *N. theisi* (Walckenaer, 1841).
— Epigynum triangular (Figs. 18, 25, 39), openings not so small (Figs. 20, 27, 41, o), dorsum of abdomen otherwise (Figs. 9-10, 33) ..... 19.
19. Carapace dark brown or dark gray, mottled with black, without middle line; dorsum of abdomen as in Fig. 33 ..... *N. nautica* (L. Koch, 1875).
— Carapace yellow, usually with distinct longitudinal black middle line as well as dark margin, sometimes whole yellow ..... 20.
20. Dorsum of abdomen with paired black spots, posteriorly fused in transversal pattern (Fig. 9) ..... *N. adianta* (Walckenaer, 1802).
— Abdomen dorsally with dark colored V-shaped marking, without transversal pattern (Fig. 10) ..... *N. amamiensis* sp. nov.

Neoscona theisi (Walckenaer, 1841)
(Figs. 1-8, 11-17, 32)

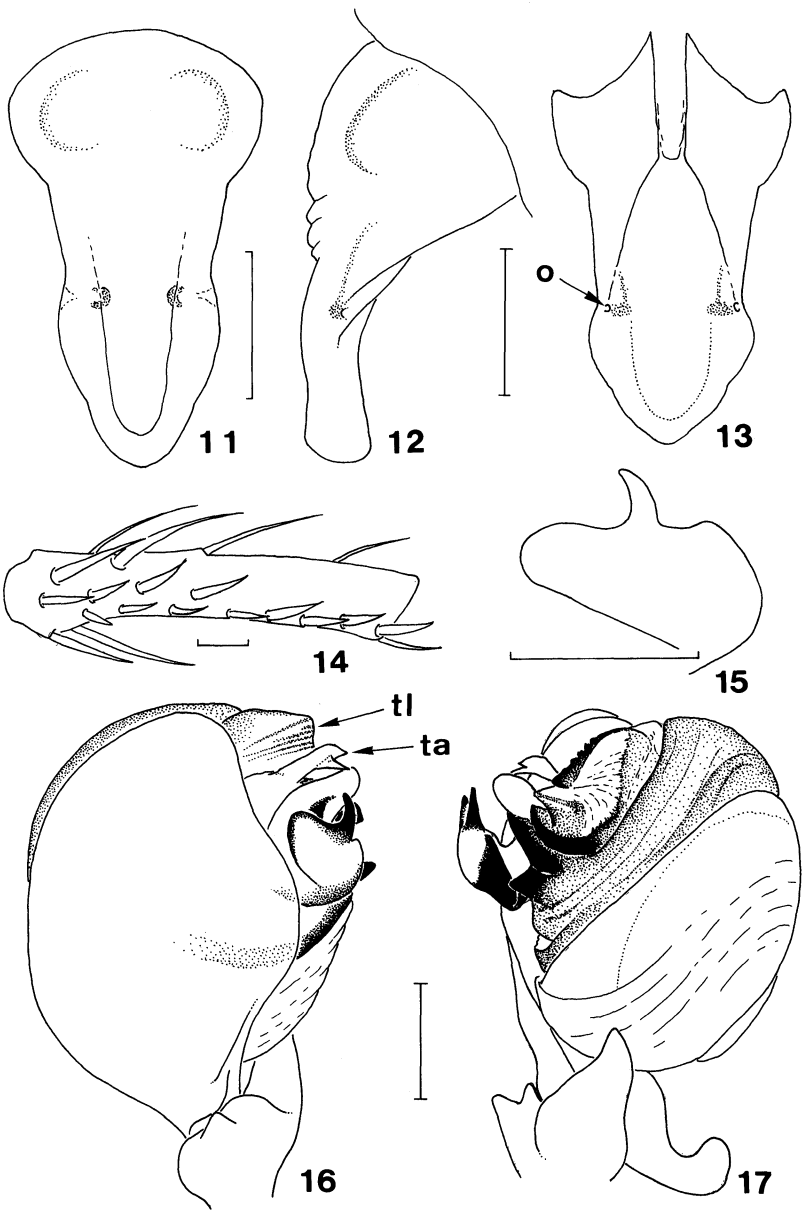
Epeira theis Walckenaer, 1841, p. 53, pl. 18, fig. 4. (Male holotype from Guam Island, not examined.)
Araneus theisi: Chrysanthus, 1960, p. 39, figs. 44, 53-55, 61, 73.
Neoscona theisi: Yaginuma, 1955, p. 17, pl. 1, fig. 3; Yaginuma, 1960, p. 57, pl. 22, fig. 130; Yaginuma, 1968, p. 57, fig. 53, pl. 22, fig. 130; Yaginuma, 1986a, p.104, figs. 55-7, pl. 25, fig. 5; Grasshoff, 1986, p.69, figs. 90-100.
Neoscona theis: Tikader, 1982, p. 269, figs. 538-542.

Specimens examined. Specimens measured: 1 ♀, Chichijima Is., Tokyo, 9-III-1988, N. Tanaka leg. (NSMT-Ar 4056), 2 ♀, Iojima Is., Tokyo, 29-30-XI-1987, N. Tanaka leg. (NSMT-Ar 4057); 1 ♀, Tokunoshima Is., Kagoshima Pref., 8-V-1997, T. Sasaki leg. (NSMT-Ar 4058); 1 ♀, Chatan, Okinawajima Is., Okinawa Pref., 2-II-1988, N. Tanaka leg. (NSMT-Ar 4059); 1 ♂, Shirahama, 25-VIII-1988 (NSMT-Ar 4060), 1 ♂, Urauchi, 23-XII-1991 (NSMT-Ar 4061), 1 ♀, Funaura, 28-XII-1990 (NSMT-Ar 4062), 2 ♂, Mihara, 31-XII-1986 (NSMT-Ar 4063), 1 ♂, Otomi, 14-VIII-1985 (NSMT-Ar 4064), Iriomotejima Is., Okinawa Pref., A. Tanikawa leg. 1 ♂, Uehara, same Island, 12-VIII-1993, S. Tazoe leg. (NSMT-Ar 4065).

Other specimens examined. Japan: 63 ♀ 40 ♂ from Tokyo (Chichijima Is. and Iojima Is.), Kagoshima (Yakushima Is., Amami-oshima Is., and Tokunoshima Is.), Okinawa (Kita-daitojima Is., Minami-daitojima Is., Iotorishima Is., Okinawajima Is., Iriomotejima Is., and Yonagunijima Is.) Prefectures. Micronesia: 6 ♀ 3 ♂ from Northern Mariana Islands (Guguan Is., Alamagan Is., Agrihan Is., Asuncion Is., and Uracus Is.).

Description. Measurement. Total L ♀ 6.58-11.6, ♂ 4.40-6.88; carapace L ♀ 2.83-4.60, ♂ 2.34-3.60; W ♀ 2.17-3.65, ♂ 2.34-3.60; abdomen L ♀ 3.15-5.00, ♂ 1.57-2.48;

Figs. 5–10. 5–8 (Top and middle), *Neoscona theisi* (Walckenaer, 1841); 9 (bottom left), *Neoscona adianta* (Walckenaer, 1802); 10 (bottom right), *Neoscona amamiensis* sp. nov.



Figs. 11–17. *Neoscona theisi* (Walckenaer, 1802). —— 11, Epigynum, ventral view; 12, same, lateral view; 13, same, dorsal view (o: opening); 14, male left tibia II, prolateral view; 15, median apophysis of male left palp, lateral view; 16, male left palp, ventral view (tl: terminal lamella; ta: terminal apophysis); 17, same, dorsal view. (Scales: 0.25 mm.)

width ♀ 3.15–5.00, ♂ 1.27–2.48. Leg L [1 ♀ from Iojima Is. (NSMT-Ar 4057) / 1 ♂ from Iriomotejima Is. (NSMT-Ar 4061)]: I, 12.9/10.98, II, 11.44/8.78 III, 7.02/5.56 IV, 12.06/9.42.

Female and male. Carapace L/W ♀ 1.26–1.31, ♂ 1.13–1.24; MOA L/W ♀ 0.86–0.97, ♂ 0.87–0.94; WA/WP ♀ 1.17–1.34, ♂ 1.18–1.40; labium L/W ♀ 0.69–0.73, ♂ 0.71–0.85; sternum L/W ♀ 1.15–1.23, ♂ 1.42–1.60; leg I L/carapace L ♀ 3.30–4.11, ♂ 3.90–4.17; male coxa IV without hook. Male palp (Figs. 15–17): terminal apophysis small (Fig. 16, ta); terminal lamella (see Grasshoff 1986) distinct and striped (Fig. 16, tl); median apophysis with a hook at about middle (Fig. 15). Abdomen L/W ♀ 1.31–1.43, ♂ 1.38–1.63; epigynum (Figs. 11–13): elongated triangle, openings small (Fig. 13, o).

Coloration and markings. Much varied as in Figs. 5–8. Carapace light brown with dark brown border and longitudinal midline. Abdomen yellowish brown, greenish brown, brown, or dark brown, bordered by lighter color, with indistinct folium, with white or yellow longitudinal marking.

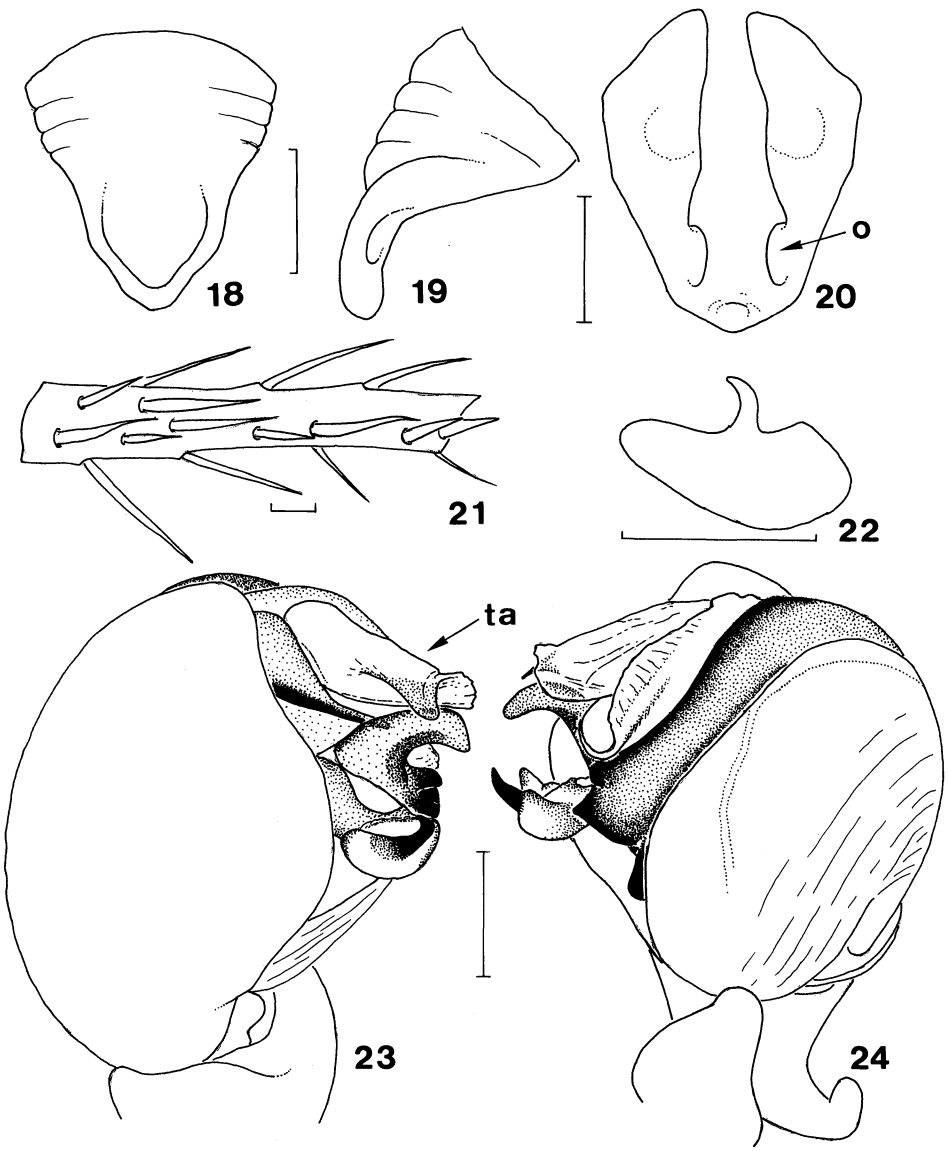
Range. Widespread in Old World tropical region.

Remarks. N. theisi somewhat resembles *N. adianta* and *N. amamiensis*, but it can be easily distinguished from those species by the following points. 1) Male palp: in *N. theisi*, terminal lamella is conspicuous and striped in ventral view (Fig. 16, tl) and terminal apophysis is small (Fig. 16, ta); while in *N. adianta* and *N. amamiensis*, terminal lamella is less conspicuous in ventral view (Figs. 13, 30) and terminal apophysis is larger (Figs. 23, 30, ta). 2) Epigynum of *N. theisi* is more elongated (Fig. 11) than those of *N. adianta* and *N. amamiensis* (Figs. 18, 25).

Neoscona adianta (Walckenaer, 1802)
(Figs. 9, 18–24, 32)

Aranea adianta Walckenaer, 1802, p. 199 (Type locality is in France, probably near Paris, type not examined); Wiehle, 1931, p.103, figs. 156–160.
Miranda adianta Menge, 1850, p. 68.
Araneus adiantus: Simon, 1895, pp. 799, 813, 828; S. Saito, 1934, p. 331; S. Saito, 1939, p. 14; S. Saito, 1959 p. 85, pl. 11, fig. 88, pl. 13, fig. 88.
Meta doenitzi Bösenberg et Strand, 1906, p. 180, Taf. 11, figs. 238–239. [Syntypes from Saga and Osaka, preserved in Senckenberg Museum, Frankfurt (SMF3977), not examined.]
Aranea adianta japonica Bösenberg et Strand, 1906, p.219, Taf. 4, fig. 27. [Holotype from Japan, preserved in Senckenberg Museum, Frankfurt (SMF3336), not examined.]
Aranea doenitzi: Strand, 1907, p. 182.
Araneus doenitzi: Schenkel, 1936, p. 110, fig. 39.
Neoscona doenitzi: Yaginuma, 1955, p. 18, pl. 1, figs. 1, 18; Yaginuma, 1960, p. 56, fig. 52, pl. 21. fig. 125; Yaginuma, 1968, p. 56, fig. 52-1, pl. 21, fig. 125; Yaginuma, 1986a, p. 103, fig. 3, pl. 25, fig. 4.
Neoscona adianta: Yaginuma, 1955, p. 18, pl. 1, fig. 2; Yaginuma, 1960, p. 57, fig. 53, pl. 22, fig. 129; Yaginuma, 1968, p. 57, fig. 53, pl. 22, fig. 129; Yaginuma, 1986b, p. 189.
Neoscona adiantum: Grasshoff, 1986. p. 66, figs. 85–89.

Specimens examined. Specimens measured. 1 ♂, Kiritappu, Akkeshi-gun, Hokkaido, 13-VIII-1986, A. Tanikawa leg. (NSMT-Ar 4066); 1 ♂, Lake Utonaiko, Tomakomai-shi, Hokkaido, 19-VII-1985, N. Tanaka leg. (NSMT-Ar 4067); 1 ♀, 22-IX-1985 (NSMT-Ar 4068), 1 ♀, 23-IX-1985 (NSMT-Ar 4069), 1 ♀, 10-VIII-1986 (NSMT-Ar 4070), Lake Izunuma, Tome-gun, Miyagi Pref., A. Tanikawa leg.; 1 ♀, Tokura, Katashina-mura, Gunma Pref., 2-VIII-1987, A. Tanikawa leg. (NSMT-Ar



Figs. 18–24. *Neoscona adianta* (Walckenaer, 1802). —— 18, Epigynum, ventral view; 19, same, lateral view; 20, same, dorsal view (o: opening); 21; male left tibia II, prolareral view; 22, median apophysis of male left palp, lateral view; 23, male left palp, ventral view (ta: terminal apophysis); 24, same, dorsal view. (Female and male: NSMT-Ar 4075; scales: 0.25 mm.)

4071); 1 ♂, Haijima-cho, Akishima-shi, Tokyo, 7-IX-1988, K. Kumada leg. (NSMT-Ar 4072); 1 ♂, Noduda, Machida-shi, Tokyo, 10-VI-1990, A. Tanikawa leg. (NSMT-Ar 4073); 1 ♀, Maioka, Yokohama-shi, Kanagawa Pref., 18-IX-1982, A. Tanikawa leg.

(NSMT-Ar 4074); 1 ♀ 1 ♂, Sugadaira, Sanada-cho, Nagano Pref., 28-VII-1980, A. Uyemura leg. (NSMT-Ar 4075).

Other specimens examined. Japan: 36 ♀ 15 ♂ from Hokkaido, Miyagi, Akita, Saitama, Gunma, Chiba, Tokyo, Kanagawa, Nagano, Shizuoka, Wakayama, Miyazaki, and Kagoshima Prefectures. France: 6 ♀ 2 ♂, 15-VII-1913 (MNHN B2493); 29 ♀ 22 ♂, 8-VII (MNHN B2523); 18 ♀ 12 ♂, Banyuls Cagnes, France (MNHN B2662).

Description. Measurement. Total L ♀ 5.59-10.13, ♂ 4.03-6.00; carapace L ♀ 2.50-4.10, ♂ 2.07-2.96; W ♀ 2.00-3.15, ♂ 1.60-2.44; abdomen L ♀ 4.10-6.37, ♂ 2.09-3.60; width ♀ 3.00-5.27, ♂ 1.64-2.52. Leg L [1 ♀ from Kanagawa Pref. (NSMT-Ar 4074) / 1 ♂ from Tokyo (NSMT-Ar 4073)]: I, 17.73/11.56, II, 14.89/8.54 III, 8.56/5.08 IV, 14.94/9.02.

Female and male. Carapace L/W ♀ 1.23-1.30, ♂ 1.21-1.29; MOA L/W ♀ 0.80-0.96, ♂ 0.89-1.00; WA/WP ♀ 1.09-1.20, ♂ 1.11-1.25; labium L/W ♀ 0.65-0.71, ♂ 0.60-0.75; sternum L/W ♀ 1.13-1.25, ♂ 1.25-1.29; leg I L/carapace L ♀ 4.18-4.37, ♂ 4.21-5.20; male coxa IV without hook. Male palp (Figs. 22-24): median apophysis with a hook at about middle (Fig. 22). Abdomen L/W ♀ 1.21-1.42, ♂ 1.27-1.43; epigynum (Figs. 18-20) tongue shape.

Coloration and markings. As in Fig. 9. Carapace pale brown with dark brown border and longitudinal midline, rarely whole yellow. Abdomen yellow, rarely reddish yellow, with white markings, and with paired black spots posteriorly fusing in transversal pattern.

Range. Widespread in Palaearctic region.

Remarks. *N. adianta* seems to be closely related to *N. amamiensis*. As for the discriminating points, see remarks of *N. amamiensis*.

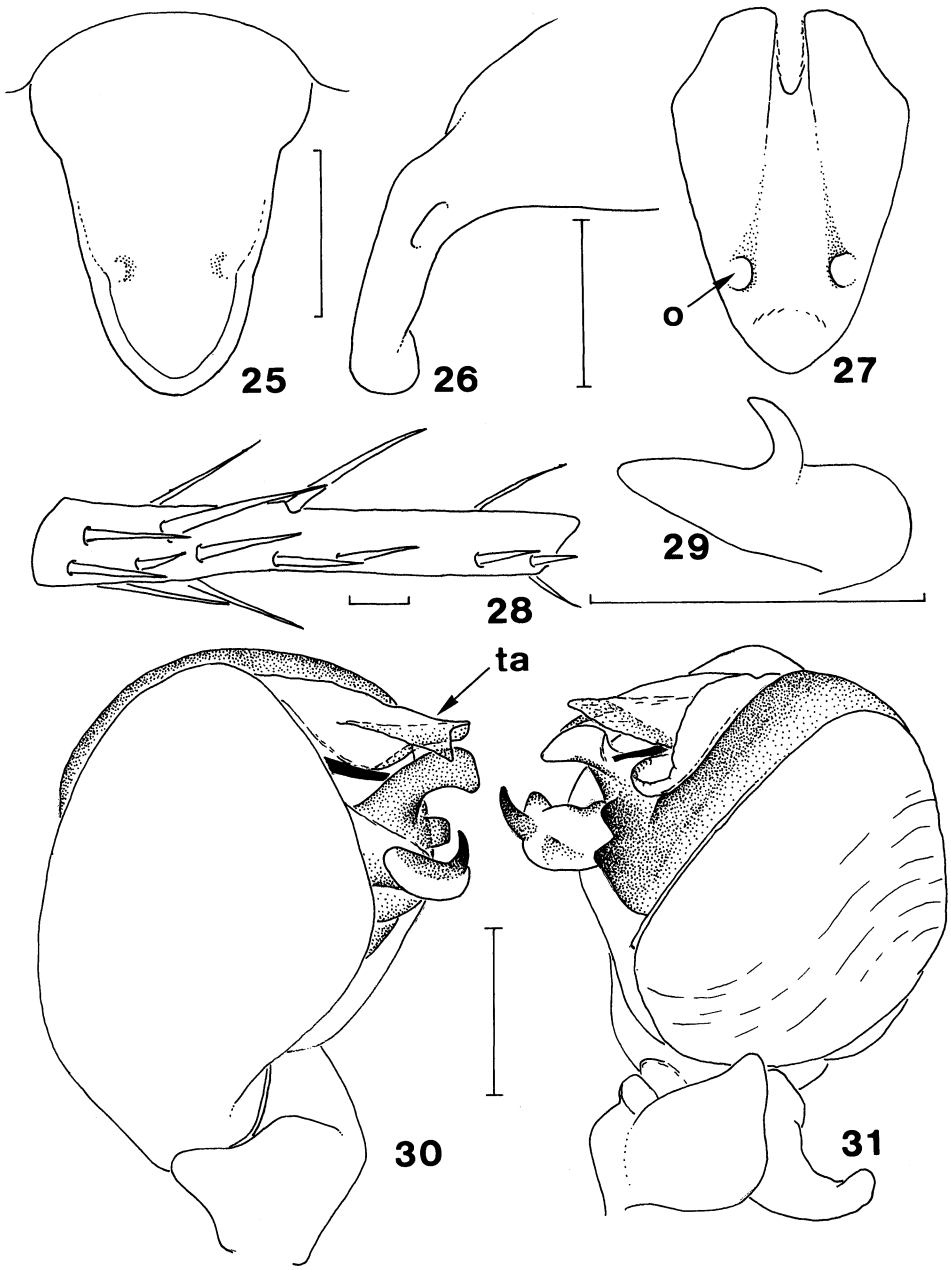
Neoscona amamiensis sp. nov.
(Figs. 10, 25-32)

Specimens examined. Type series. Holotype: ♀, Kasarizaki, Amami-oshima Is., Kagoshima Pref., Japan, 17-VIII-1996, A. Tanikawa leg. (NSMT-Ar 4076). Paratypes: 1 ♀, 17-VIII-1996, Tatsugo (NSMT-Ar 4077), 1 ♀, 17-VIII-1996 (NSMT-Ar 4078), 2 ♀ 1 ♂, 18-VIII-1996, Kasarizaki (NSMT-Ar 4079), same island and collector as for the holotype.

Other specimens examined. 6 ♀, same data as for the holotype.

Description [based on the female holotype and the male paratype, variations among female type specimens are given in the parentheses] . Measurement. Total L ♀ 9.10 (7.71-9.15), ♂ 4.70; carapace L ♀ 3.36 (3.36-3.80), ♂ 2.66; W ♀ 2.58 (2.58-2.96), ♂ 2.06; abdomen L ♀ 6.13 (5.11-6.13), ♂ 2.57; width ♀ 3.53 (3.17-3.73), ♂ 1.63. Leg L [female holotype/male paratype; tarsus + metatarsus + tibia + patella + femur = total]: I, 1.12 + 4.02 + 3.20 + 1.62 + 3.96 = 13.92 / 1.04 + 3.78 + 3.16 + 1.28 + 3.56 = 12.82; II, 1.00 + 3.28 + 2.60 + 1.46 + 3.50 = 11.84/0.86 + 2.66 + 1.98 + 1.04 + 2.76 = 9.30; III, 0.76 + 1.56 + 1.30 + 0.96 + 2.20 = 6.78 / 0.60 + 1.20 + 1.02 + 0.68 + 1.80 = 5.30; IV, 0.90 + 3.26 + 2.72 + 1.36 + 3.98 = 12.22 / 0.76 + 2.72 + 2.24 + 1.02 + 3.16 = 9.90.

Female and male. Carapace L/W ♀ 1.30 (1.25-1.30), ♂ 1.29; MOA L/W ♀ 1.03 (0.97-1.08), ♂ 0.96; WA/WP ♀ 1.11 (1.07-1.16), ♂ 1.17; labium L/W ♀ 0.70 (0.67-0.76), ♂ 0.68; sternum L/W ♀ 1.16 (1.16-1.21), ♂ 1.34; leg I L/carapace L ♀ 4.14



Figs. 25–31. *Neoscona amamiensis* sp. nov. —— 25, Epigynum, ventral view; 26, same, lateral view; 27, same, dorsal view (o: opening); 28, male left tibia II, prolateral view; 29, median apophysis of male left palp, lateral view; 30, male left palp, ventral view (ta: terminal apophysis); 31, same, dorsal view. (Female: holotype, male: paratype; scales: 0.25 mm.)

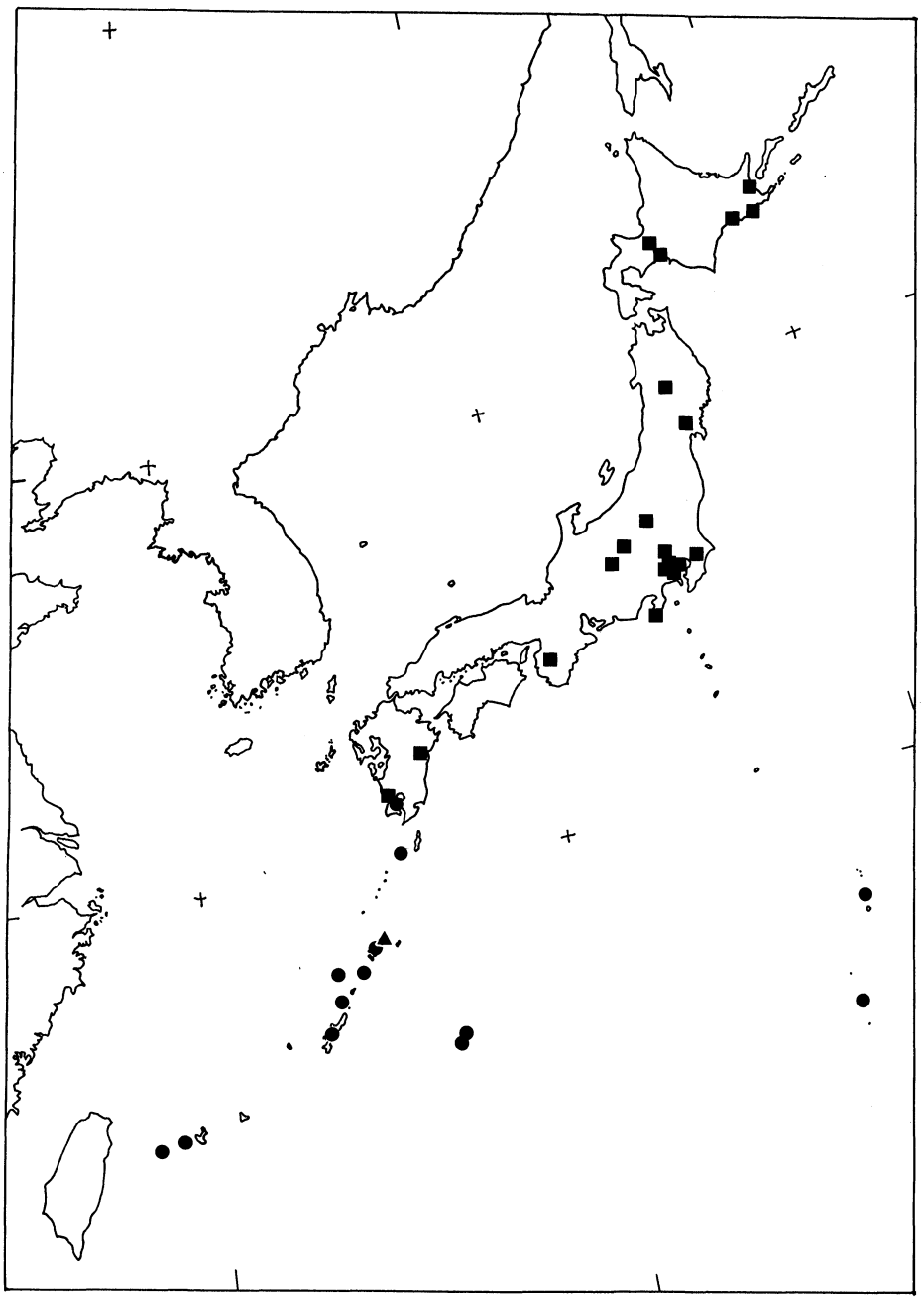


Fig. 32. The localities of the specimens examined in this sudy. ●: *Neoscona theisi* (Walckenaer, 1841), ■: *Neoscona adianta* (Walckenaer, 1802), ▲: *Neoscona amamiensis* sp. nov.

(3.66–4.32), ♂ 4.82; male coxa IV without hook. Male palp (Figs. 29–31): median apophysis with a hook at about middle (Fig. 29). Abdomen L/W ♀ 1.74 (1.48–1.74), ♂ 1.58; epigynum (Figs. 25–27) tongue shape.

Coloration and markings. As in Fig. 10. Carapace pale brown with dark brown border and longitudinal midline, sometimes without border. Abdomen brown or pale brown with yellow border, with V-shaped yellow and dark brown marking.

Range. Japan (Amami-oshima Island).

Remarks. N. amamiensis can be easily distinguished from the other species of the genus by the marking of the abdomen. Judging from the features of genital organs of both sexes, *N. amamiensis* seems to be closely related to *N. adianta*. These species can be separated by the shape of the abdomen as well as the marking (abdomen L/W, *N. amamiensis*: ♀ 1.48–1.74, ♂ 1.58, *N. adianta*: ♀ 1.21—1.42, ♂ 1.27—1.43).

Etymology. The specific name is derived from the native Island of the species.

Neoscona nautica (L. Koch, 1875)
(Figs. 33, 39–45, 53)

Epeira nautica Koch, 1875, p. 17. (Female holotype from Sudan, preserved in BMNH, not examined.)
Araneus nauticus: Simon, 1895, pp. 813, 826, 828; S. Saito, 1959, p. 90, pl. 12, fig. 104, pl. 13, fig. 104.
Aranea nautica: Bösenberg & Strand, 1906, p. 222, taf. 4, fig. 31, taf. 11, figs. 197, 204, taf. 12, fig. 209. (Indicated as *A. Theisi* in text, corrected on p. 403.)
Aranea koratsensis Dönitz et Strand in Bösenberg & Strand, 1906, p. 384, pl. 4, fig. 25.
Neoscona nautica: Petrunkevitch, 1930, pp. 313, 315, 320; Yaginuma, 1955, p.17, pl. 1, figs. 5, 15; Yaginuma, 1960, p.56, fig. 52–3, pl. 21, fig. 125; Yaginuma, 1968, p.56, 52–3, pl. 21, fig. 126; Berman & Levi, 1971, p. 498, figs. 13, 111–120, 132; Tikader, 1982, p. 242, figs. 466–469; Yaginuma, 1986a, p. 105, fig. 55–6, pl. 26, fig. 1; Grasshoff, 1986, p. 46, figs. 60–63.; Levi, 1992, p. 228, figs. 10–13.
Araneus theisi: S. Saito, 1939, p.22, fig. 3–5. [nec Walckenaer, 1841]

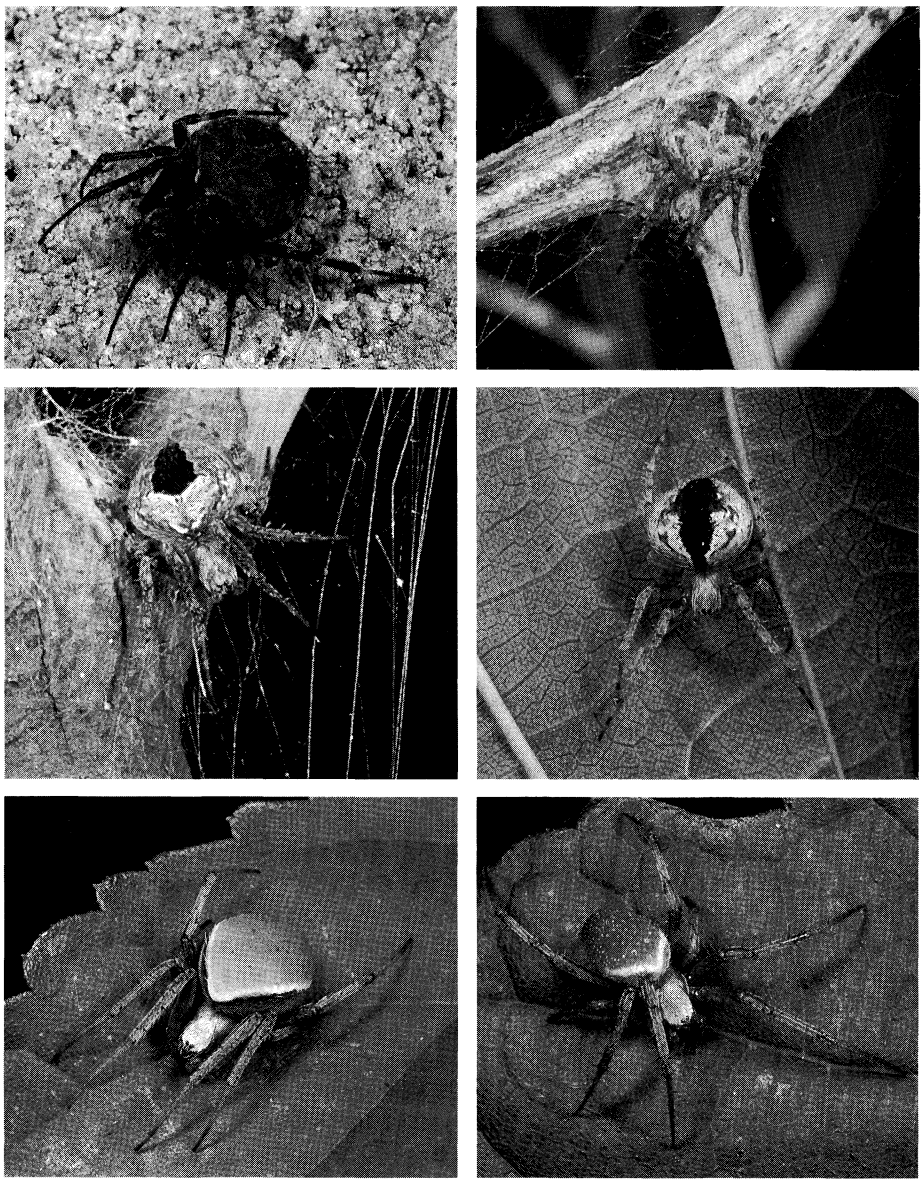
Specimens examined. Specimens measured. 1 ♂, Shin-hanamaki Station, Hanamaki-shi, Morioka Pref., 4-VIII-1994, M. Ban leg. (NSMT-Ar 4080); 1 ♂, Naruko-cho, Tamatsukuri-gun, Miyagi Pref., 26-VII-1996, K. Kumada leg. (NSMT-Ar 4081); 1 ♂, Tsukuba-shi, Ibaraki Pref., 20-IX-1975, T. Takai leg. (NSMT-Ar 4082); 1 ♀, Maioka-cho, Yokohama-shi, Kanagawa Pref., 28-VIII-1980, A. Tanikawa leg. (NSMT-Ar 4083); 1 ♀, Oiso-cho, Naka-gun, Kanagawa Pref., 30-IX-1984, A. Tanikawa leg. (NSMT-Ar 4084); 1 ♀, same locality, 30-IX-1984, N. Tanaka leg. (NSMT-Ar 4085); 1 ♀ 1 ♂, Otsuki Station, Otsuki-shi, Yamanashi Pref., 23-VII-1984, K. Kumada leg. (NSMT-Ar 4086); 1 ♂, Tokoji, Kofu-shi, Yamanashi Pref., 1-VII-1990, K. Kumada leg. (NSMT-Ar 4087); 1 ♀, Kurashiki-shi, Okayama Pref., 21-IX-1982, A. Tanikawa leg. (NSMT-Ar 4088).

Other specimens examined. Japan: 10 ♀ from Iwate, Ibaraki, Kanagawa, and Kumamoto Prefectures. Thailand: 2 ♀ 1 ♂ from Phuket Island.

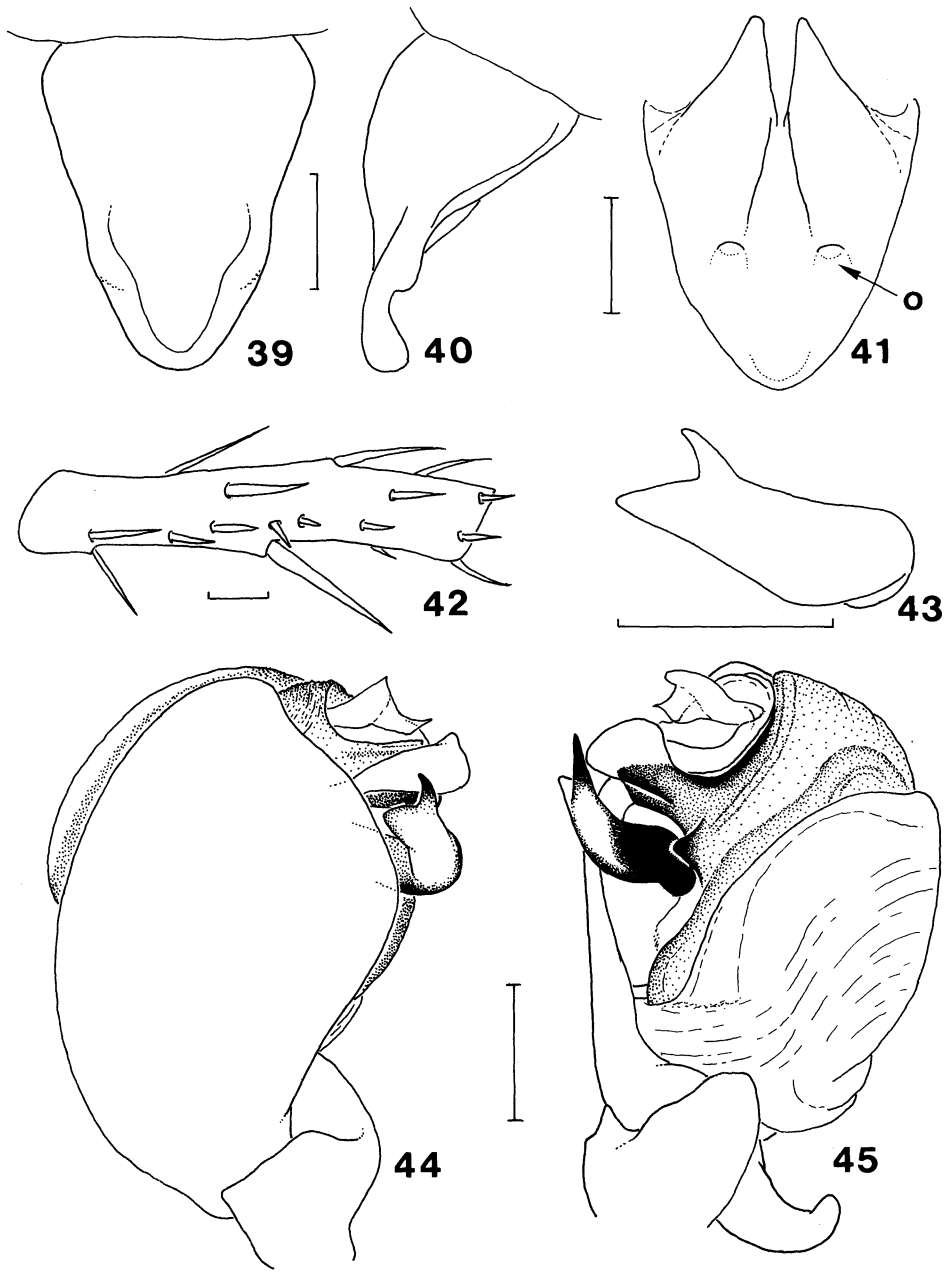
Description. Measurement. Total L ♀ 8.00–11.75, ♂ 4.60–5.22; carapace L ♀ 3.60–4.15, ♂ 2.30–2.90; W ♀ 3.04–3.75, ♂ 1.96–2.40; abdomen L ♀ 5.00–7.17, ♂ 2.15–2.97; width ♀ 4.44–7.08, ♂ 2.11–2.30. Leg L [1 ♀ from Kanagawa Pref. (NSMT-Ar 4085) / 1 ♂ from Yamanashi Pref. (NSMT-Ar 4086)]: I, 15.13/12.28, II, 13.10/9.64, III, 8.03/6.08, IV, 13.05/9.72.

Female and male. Carapace L/W ♀ 1.08–1.19, ♂ 1.17–1.23; MOA L/W ♀ 0.79–0.89, ♂ 0.76–0.89; WA/WP ♀ 1.32–1.41, ♂ 1.35–1.43; labium L/W ♀ 0.67–0.84, ♂

0.68–0.71; sternum L/W ♀ 1.04–1.14, ♂ 1.29–1.38; leg I L/carapace L ♀ 3.82–4.34, ♂ 4.10–4.40; male coxa IV without hook; tibia II ventrally with a large spine at about middle (Fig. 42). Male palp (Figs. 43–45): median apophysis with a hook at distal half



Figs. 33–38. 33 (Top left), *Neoscona nautica* (L. Koch, 1875); 34–36 (top right and middle), *Neoscona subpullata* (Bösenberg et Strand, 1906); 37 (bottom left), *Neoscona mellotteei* (Simon, 1895); 38 (bottom right), *Neoscona scylloides* (Bösenberg et Strand, 1906).



Figs. 39–45. *Neoscona nautica* (L. Koch, 1875) —— 39, Epigynum, ventral view; 40, same, lateral view; 41, same, dorsal view (o: opening); 42, male left tibia II, prolateral view; 43, median apophysis of male left palp, lateral view; 44, male left palp, ventral view; 45, same, dorsal view. (Female and male: NSMT-Ar 4086; scales: 0.25 mm.)

(Fig. 43). Abdomen L/W ♀ 0.98–1.13, ♂ 0.98–1.34; epigynum (Figs. 39–41) triangular.

Coloration and markings. As in Fig. 33. Carapace pale brown, brown, or dark gray, with dark colored border, head region and around median fovea also darker. Abdomen pale brown, brown or dark gray, with folium.

Range. Widespread in warm and tropical region of all the world.

Remarks. N. nautica can be easily distinguished from the other species of the genus by the general appearance. The triangular epigynum (Fig. 39) and a ventral large spine at the middle of the male tibia II (Fig. 42) are also characteristic.

Neoscona subpullata (Bösenberg et Strand, 1906)
(Figs. 33–35, 39–45, 53)

Aranea subpullata Bösenberg et Strand, 1906, p.234, taf. 11, figs. 232–233. (Syntypes from Saga, Japan, preserved in Senckenberg Museum, Frankfurt, not examined.)

Neoscona subpullata: Yaginuma, 1955, p. 20, pl. 1, fig. 4; Yaginuma, 1986a, p. 105, fig. 55-8, pl. 26, fig. 3.

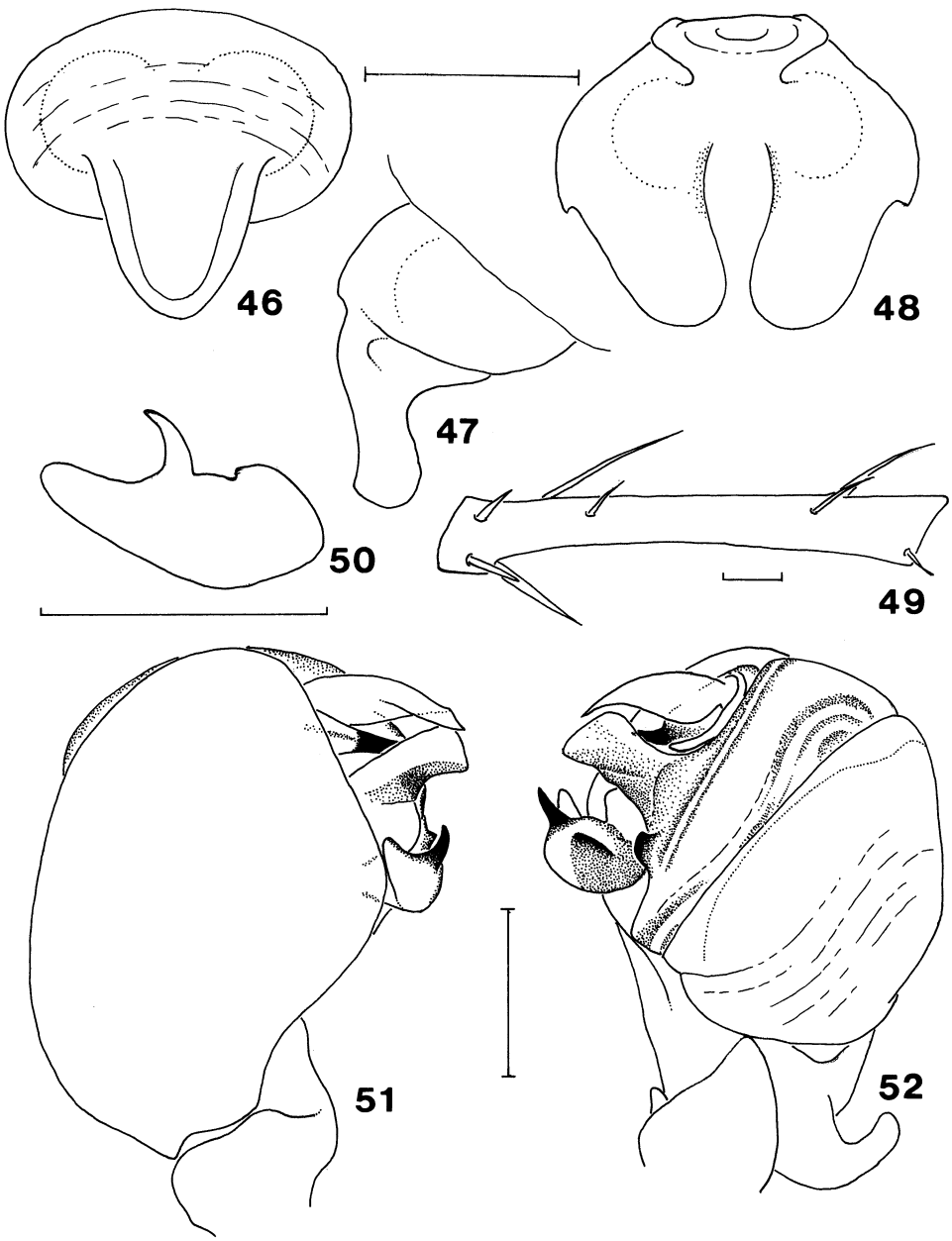
Araneus subpullatus: Yaginuma, 1960, p. 52, fig. 48, pl. 17, fig. 106; Yaginuma, 1968, p. 52, fig. 48, pl. 17, fig. 106.

Specimens examined. Specimens measured. 1 ♀, Arasaki, Yokosuka-shi, Kanagawa Pref., 16-VI-1985, N. Tanaka leg. (NSMT-Ar 4089); 1 ♀ 1 ♂, Kenzaki, Miura-shi, Kanagawa Pref., 21-XI-1974, K. Kumada leg. (NSMT-Ar 4090); 1 ♀, Hananoiwaya, Kumano-shi, Mie Pref., 25-VII-1993, A. Tanikawa leg. (NSMT-Ar 4091); 1 ♀ 1 ♂, Aoshima, Miyazaki-shi, Miyazaki Pref., 10-VIII-1992, A. Tanikawa leg. (NSMT-Ar 4092); 1 ♀, Yona, Okinawajima Is., Okinawa Pref., 28-III-1997, A. Tanikawa leg. (NSMT-Ar 4093); 1 ♂, Komi, Iriomotejima Is., Okinawa Pref., 29-III-1994, A. Tanikawa leg. (NSMT-Ar 4094); 1 ♂, Haterumajima Is., Okinawa Pref., 31-X-1987, N. Tanaka leg. (NSMT-Ar 4095); 1 ♂, Agarizaki, Yonaguni-jima, Okinawa Pref., 1-I-1996, T. Kamura leg. (NSMT-Ar 4096); 1 ♀, 2-XI-1987, same Island, N. Tanaka leg. (NSMT-Ar 4097).

Other specimens examined. 106 ♀ 60 ♂ from Tokyo (Miyakejima Is.), Kanagawa, Shizuoka, Aichi, Mie, Wakayama, Ehime, Miyazaki, Kagoshima (Kagoshima-shi, Yakushima Is., Amami-oshima Is., and Tokunoshima Is.), and Okinawa (Minami-daitojima Is., Iotorishima Is., Okinawajima Is., Iriomotejima Is., Haterumajima Is., and Yonagunijima Is.) Prefectures.

Description. Measurement. Total L ♀ 4.25–7.23, ♂ 2.77–4.55; carapace L ♀ 1.69–2.97, ♂ 1.60–2.43; W ♀ 1.31–2.40, ♂ 1.27–1.97; abdomen L ♀ 2.57–4.10, ♂ 1.67–2.35; width ♀ 2.71–4.55, ♂ 1.44–2.15. Leg L [1 ♀ from Mie Pref. (NSMT-Ar 4091) / 1 ♂ from Okinawa Pref. (NSMT-Ar 4094)]: I, 8.22/8.20, II, 6.63/6.92, III, 4.55/3.88, IV, 6.88/5.96.

Female and male. Carapace L/W ♀ 1.23–1.29, ♂ 1.20–1.26; MOA L/W ♀ 0.83–0.87, ♂ 0.87–1.00; WA/WP ♀ 1.15–1.28, ♂ 1.15–1.32; labium L/W ♀ 0.58–0.68, ♂ 0.52–0.68; sternum L/W ♀ 1.06–1.19, ♂ 1.11–1.22; leg I L/carapace L ♀ 3.45–3.72, ♂ 4.30–4.61; male coxa IV without hook; number of spines on tibia II almost as same as tibia I. Male palp (Figs. 50–52): median apophysis with a hook at about middle (Fig. 50). Abdomen L/W ♀ 0.90–0.99, ♂ 1.02–1.16; scape of epigynum short (Figs. 46–47).



Figs. 46–52. *Neoscona subpullata* (Bösenberg et Strand, 1906) —— 46, Epigynum, ventral view; 47, same, lateral view; 48, same, posterior view; 49, male left tibia II, prolateral view; 50, median apophysis of male left palp, lateral view; 51, male left palp, ventral view; 52, same, dorsal view. (Female and male: NSMT-Ar 4090; scales: 0.25 mm.)

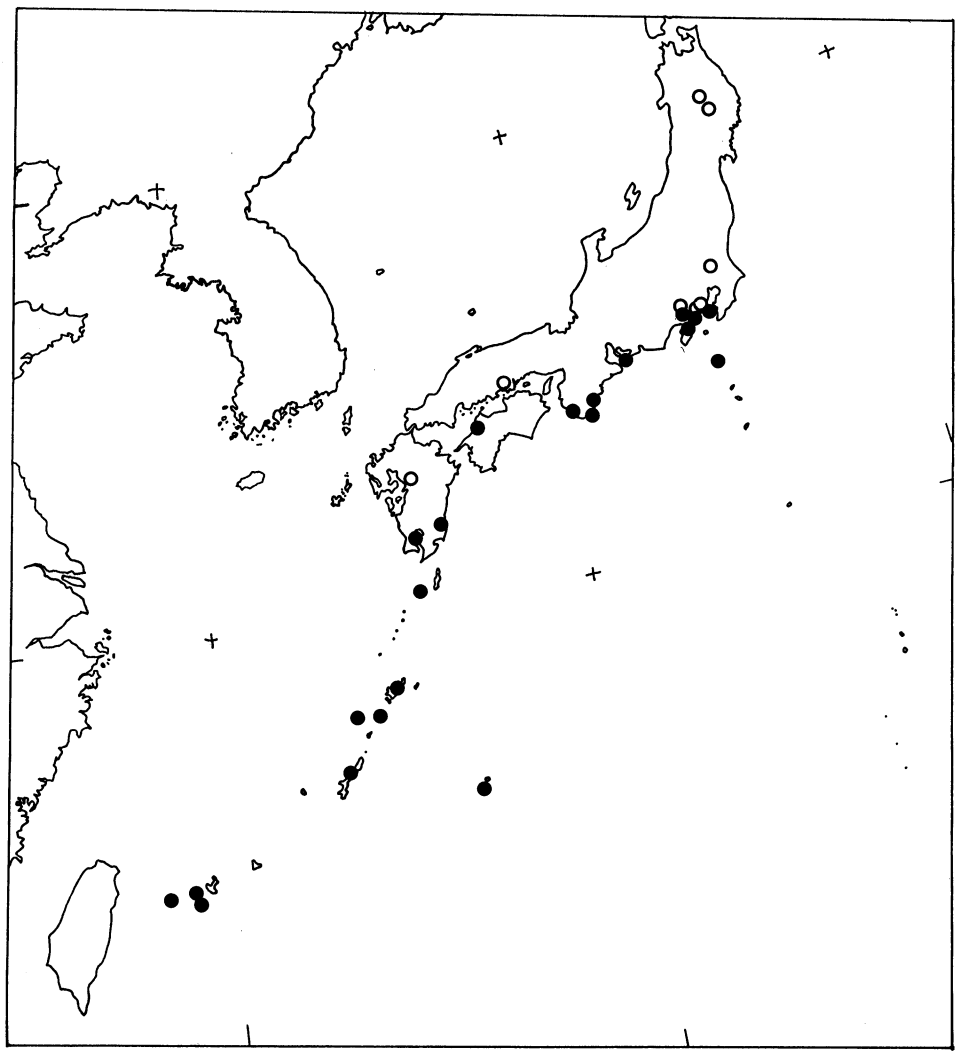


Fig. 53. The localities of the specimens examined in this study. ○: *Neoscona nautica* (L. Koch, 1875), ●: *Neoscona subpullata* (Bösenberg et Strand, 1906)

Coloration and markings. Somewhat varied as in Figs. 34–36. Carapace pale brown, anteriorly darker. Abdomen pale brown, anteriorly with light colored marking and posteriorly with folium, sometimes posteriorly with large black spot, sometimes with longitudinal black midline.

Range. East Asia (Japan, China, Korea, Taiwan).

Remarks. *N. subpullata* can be easily distinguished from the other species of the genus by its general appearance. In general appearance, *N. subpullata* resembles *Araneus fuscocoloratus* Bösenberg et Strand, 1906 and related species, but the structures of the genital organs of both female and male are quite different from those species.

The tibia II of male spiders of the genus *Neoscona* other than *N. subpullata* are provided with much more strong spines than tibia I, but that of *N. subpullata* with only several spines (Fig. 49) as well as tibia I.

Neoscona mellotteei (Simon, 1895)
(Figs. 37, 54-61, 69)

Araneus mellotteei Simon, 1895, p. 812 (Type specimen from Yokohama, Japan, not examined.); S. Saito, 1939, p. 19.

Aranea Mellotteei: Bösenberg & Strand, 1906, p. 218, taf. 11, fig. 223.

Neoscona mellotteei: Yaginuma, 1955, p. 19, pl. 1, fig. 11; Yaginuma, 1960, p. 57, fig. 53, pl. 22, fig. 128; Yaginuma, 1968, p. 57, fig. 53, pl. 22, fig. 128; Yaginuma, 1986a, p. 103, fig. 55-1 (misprinted as 55-2), pl. 25, fig. 3.

Specimens examined. Specimens measured. 1 ♀, Lake Tazawako, Senpoku-gun, Akita Pref., 18-VIII-1990, S. Tazoe leg. (NSMT-Ar 4098); 1 ♂, same locality and date, A. Tanikawa leg. (NSMT-Ar 4099); 1 ♂, Noduda, Machida-shi, Tokyo, 23-VIII-1990, A. Tanikawa leg. (NSMT-Ar 4100); 1 ♂, Maioka-cho, Yokohama-shi, Kanagawa Pref., 28-VIII-1980, H. Iijima leg. (NSMT-Ar 4101); 1 ♀, same locality, 3-X-1981, K. Tajima leg. (NSMT-Ar 4102); 1 ♀, Izuminomori, Yamato-shi, Kanagawa Pref., 30-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4103); 1 ♂, Tahara-cho, Atsumi-gun, Aichi Pref., 25-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4104); 1 ♂, Washio, Kosai-shi, Shizuoka Pref., 25-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4105); 1 ♀, Shionomisaki, Nishimuro-gun, Wakayama Pref., 31-VIII-1990, A. Tanikawa leg. (NSMT-Ar 4106); 1 ♀ 1 ♂, Shirahama-cho, Nishimuro-gun, Wakayama Pref., 22-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4107); 1 ♀, Miyazaki-jingu, Miyazaki-shi, Miyazaki Pref., 18-VIII-1989, A. Tanikawa leg. (NSMT-Ar 4108).

Other specimens examined. 46 ♀ 21 ♂ from Akita, Ibaraki, Tokyo, Kanagawa, Yamanashi, Shizuoka, Aichi, Mie, Wakayama, Okayama, Hiroshima, Miyazaki, Kagoshima (Kagoshima-shi, Amami-oshima Is.), Okinawa (Iriomotejima Is.) Prefectures.

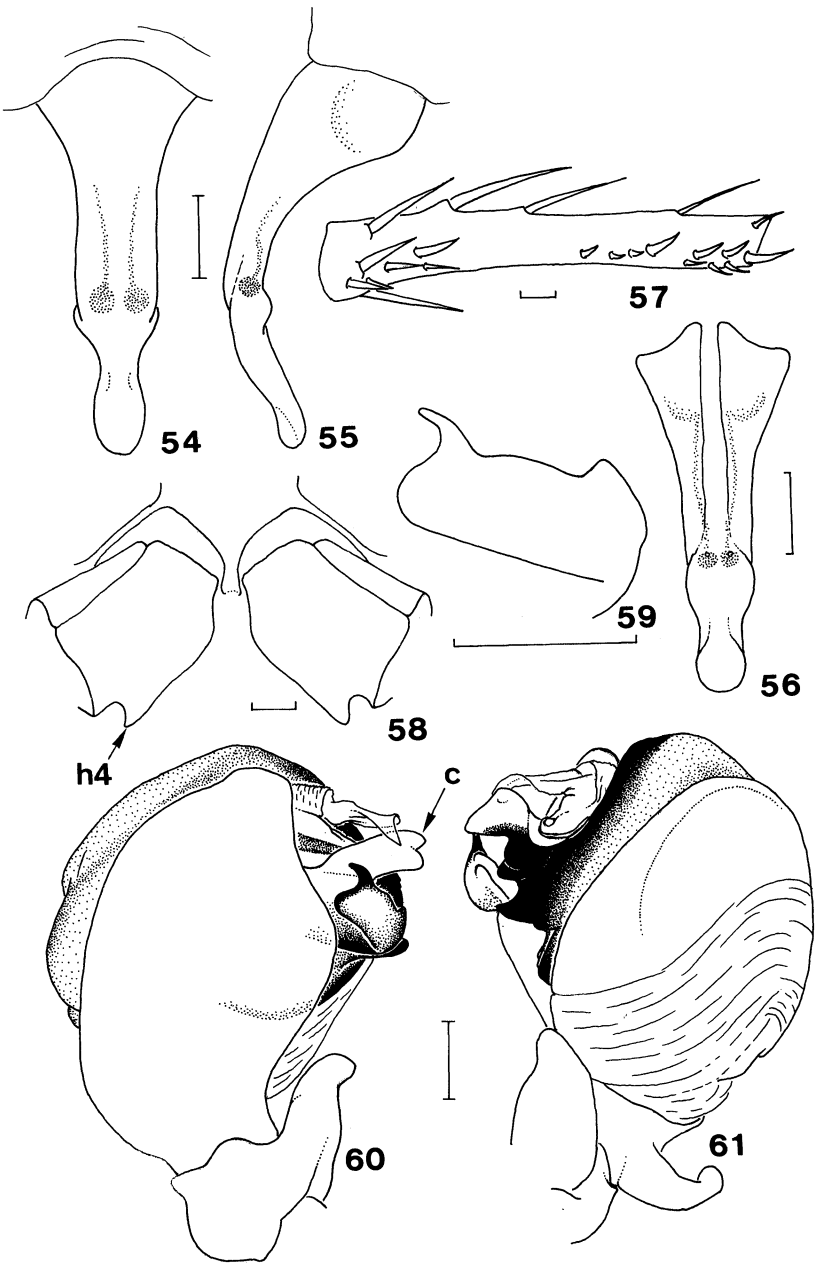
Description. Measurement. Total L ♀ 6.33-9.50, ♂ 5.62-8.70; carapace L ♀ 2.54-4.05, ♂ 3.17-4.50; W ♀ 2.00-3.20, ♂ 2.67-3.85; abdomen L ♀ 3.72-6.13, ♂ 3.10-4.45; width ♀ 3.50-5.33, ♂ 1.90-3.90. Leg L [1 ♀ from Wakayama Pref. (NSMT-Ar 4106) / 1 ♂ from Kanagawa Pref. (NSMT-Ar 4101)]: I, 13.88/16.00, II, 12.46/12.98, III, 7.32/7.98, IV, 12.38/13.96.

Female and male. Carapace L/W ♀ 1.24-1.28, ♂ 1.17-1.22; MOA L/W ♀ 0.84-0.94, ♂ 0.86-0.97; WA/WP ♀ 1.23-1.29, ♂ 1.32-1.37; labium L/W ♀ 0.66-0.80, ♂ 0.79-0.89; sternum L/W ♀ 1.13-1.20, ♂ 1.36-1.43; leg I L/carapace L ♀ 3.73-4.04, ♂ 3.72-4.08; male coxa IV with hook (Fig. 58, h4). Male palp (Figs. 59-61): tip of conductor bifurcated (Fig. 60, c), median apophysis with hook at distal half (Fig. 59) Abdomen L/W ♀ 1.03-1.15, ♂ 1.14-1.68; epigynum long and narrow (Figs. 54-56).

Coloration and markings. As in Fig. 37. Carapace brown, anteriorly darker, with dark colored border in male. Abdomen dorsally green in life, yellow in alcohol, rarely with black marking, ventrally brown in life, light brown in alcohol.

Range. East Asia (Japan, China, Korea, Taiwan).

Remarks. N. mellotteei seems to be closely related to *N. scylloides*. These two species can be separated by the following points. Though dorsal side of abdomen is



Figs. 54–61. *Neoscona mellotteei* (Simon, 1895) —— 54, Epigynum, ventral view; 55, same, lateral view; 56, same, dorsal view; 57, male left tibia II, prolateral view; 58, male coxa IV, ventral view (h4: hook); 59, median apophysis of male left palp, lateral view; 60, male left palp, ventral view (c: conductor); 61, same, dorsal view. (Female and male: NSMT-Ar 4107; scales: 0.25 mm.)

green (pale yellow in alcohol) in both the species, ventral side of the abdomen is brown in *N. mellotteei* and green in *N. scylloides* (yellow in alcohol). The tip of male palpal conductor bifurcated in *N. mellotteei* (Fig. 60, c) while not in *N. scylloides* (Fig. 67, c).

Neoscona scylloides (Bösenberg et Strand, 1906)
(Figs. 38, 62–68, 69)

Aranea scylloides Bösenberg et Strand, 1906, p. 217, taf. 4, fig. 26, taf. 11, fig. 209. (Syntypes from Saga, Japan, preserved in Senckenberg Museum, Frankfurt, not examined.)
Araneus scylloides: S. Saito, 1939, p. 21, figs. 3–4; S. Saito, 1959, p. 89, pl. 12, fig. 102, pl. 13, fig. 102.
Neoscona scylloides: Yaginuma, 1955, p. 18, pl. 1, figs. 10, 13; Yaginuma, 1960, p. 57, fig. 53, pl. 22, fig. 127; Yaginuma, 1968, p. 57, fig. 53, pl. 22, fig. 127; Yaginuma, 1986a, p. 103, fig. 55-2 (misprinted as 55-1), pl. 25, fig. 2.

Specimens examines. Specimens measured. 1 ♀, Tazawako Lake, Senpoku-gun, Akita Pref., 19-VIII-1990, S. Tazoe leg. (NSMT-Ar 4109); 1 ♂, Noba-cho, Yokohama-shi, Kanagawa Pref., 17-VII-1980, A. Tanikawa leg. (NSMT-Ar 4110); 1 ♂, same locality, 19-VII-1980, H. Iijima leg. (NSMT-Ar 4111); 1 ♀, Enkaizan, Yokohama-shi, Kanagawa Pref., 10-VIII-1984, N. Tanaka leg. (NSMT-Ar 4112); 2 ♀, Shiroyama-koen, Matsumoto-shi, Nagano Pref., 9-VIII-1990, A. Tanikawa leg. (NSMT-Ar 4113); 1 ♂, Nakaizu-cho, Tagata-gun, Shizuoka Pref., 4-VIII-1995, A. Tanikawa leg. (NSMT-Ar 4114); 2 ♂, Minamiizu-cho, Kamo-gun, Shizuoka Pref., 26-VII-1992, A. Tanikawa leg. (NSMT-Ar 4115); 1 ♀, Mie Pref., 20-VIII-1980, A. Uyemura leg. (NSMT-Ar 4116); 1 ♀, Higashitaichi, Tamano-shi, Okayama Pref., 26-VIII-1991, A. Tanikawa leg. (NSMT-Ar 4117).

Other specimens examined. 16 ♀ 10 ♂ from Akita, Miyagi, Ibaraki, Tochigi, Chiba, Kanagawa, Nagano, Shizuoka, Mie, Tottori, Okayama, Miyazaki, and Okinawa (Okinawajima Is.) Prefectures.

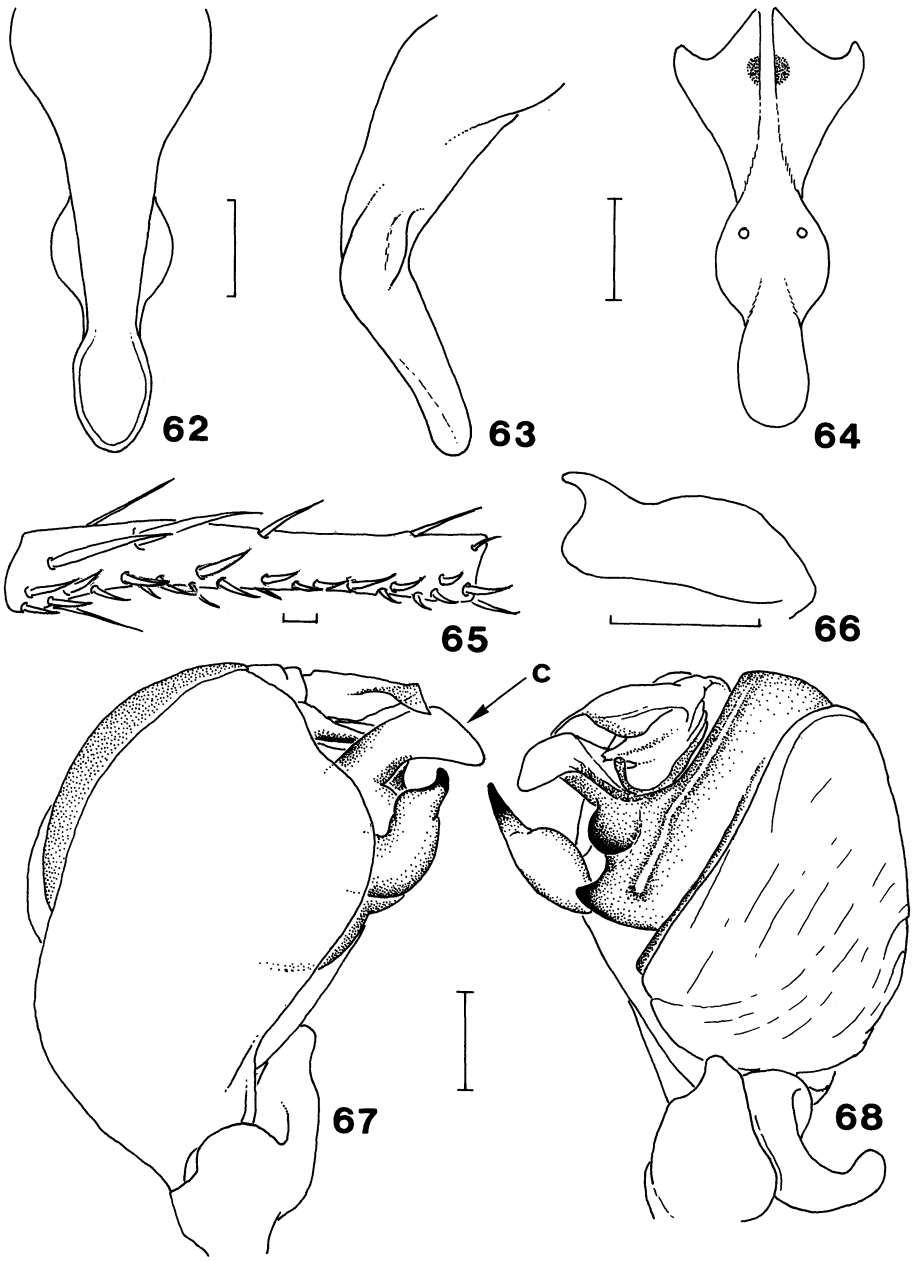
Description. Measurement. Total L ♀ 7.15–10.38, ♂ 7.54–8.70; carapace L ♀ 3.20–4.50, ♂ 3.72–4.30; W ♀ 2.52–3.70, ♂ 3.04–3.68; abdomen L ♀ 4.70–7.00, ♂ 3.90–5.11; width ♀ 3.30–6.15, ♂ 2.64–3.72. Leg L [1 ♀ from Akita Pref. (NSMT-Ar 4109) / 1 ♂ from Shizuoka Pref. (NSMT-Ar 4115)]: I, 14.86/17.93, II, 13.28/15.03, III, 7.86/9.59, IV, 13.18/15.91.

Female and male. Carapace L/W ♀ 1.22–1.27, ♂ 1.14–1.22; MOA L/W ♀ 0.85–0.91, ♂ 0.86–0.94; WA/WP ♀ 1.19–1.32, ♂ 1.25–1.31; labium L/W ♀ 0.71–0.76, ♂ 0.83–0.90; sternum L/W ♀ 1.08–1.14, ♂ 1.37–1.60; leg I L/carapace L ♀ 4.13–4.59, ♂ 4.40–4.67; male coxa IV with hook. Male palp (Figs. 66–68): median apophysis with hook at distal half (Fig. 66). Abdomen L/W ♀ 1.14–1.42, ♂ 1.37–1.60; epigynum long and narrow (Figs. 62–64).

Coloration and markings. As in Fig. 38. Carapace brown, with dark colored border in male. Abdomen both dorsally and ventrally green in life, yellow in alcohol, anteriorly with yellow border, white in alcohol.

Range. East Asia (Japan, China, Korea, Taiwan).

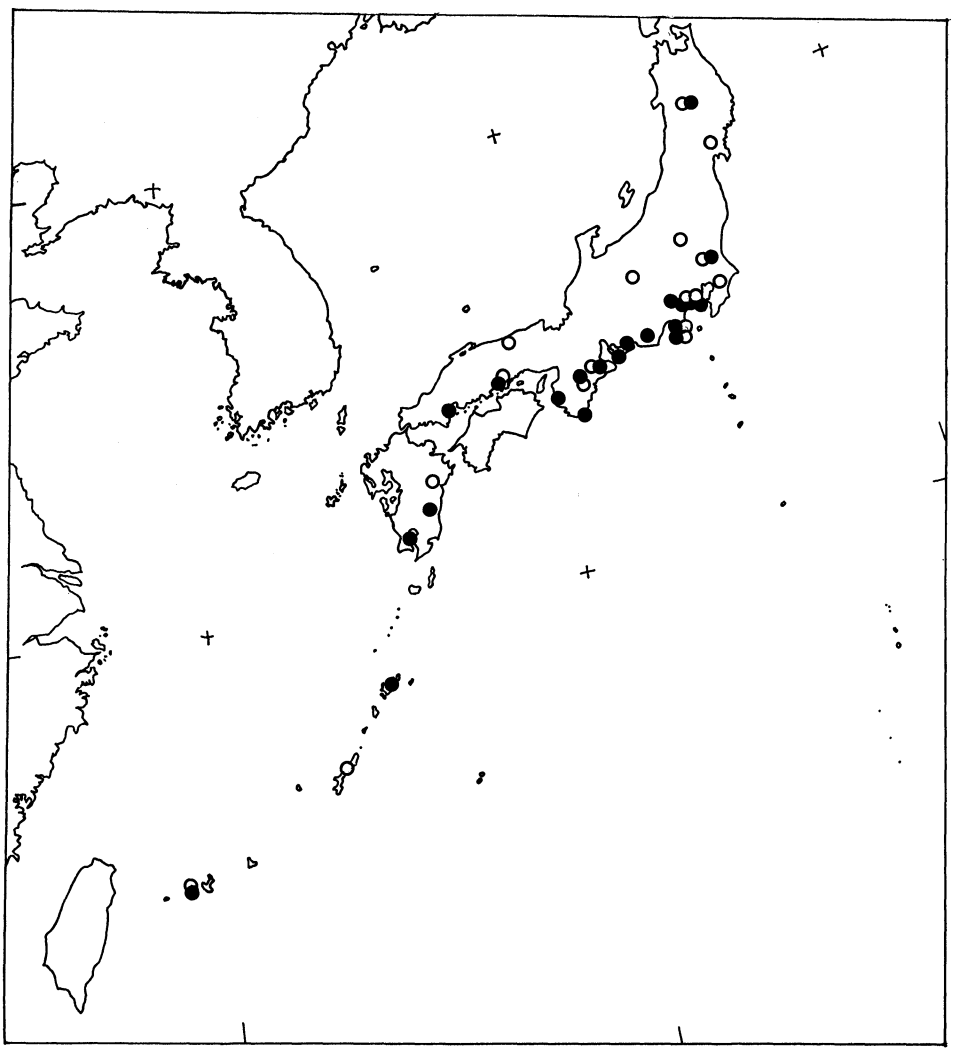
Remarks. *N. scylloides* seem to be closely related to *N. mellotteei*. As for the discriminating point, see remarks of *N. mellotteei*.



Figs. 62–68. *Neoscona scylloides* (Bösenberg et Strand, 1906) —— 62, Epigynum, ventral view; 63, same, lateral view; 64, same, dorsal view; 65, male left tibia II, prolateral view; 66, median apophysis of male left palp, lateral view; 67, male left palp, ventral view (c: conductor); 68, same, dorsal view. (Female: NSMT-Ar 4112, male: NSMT-Ar 4111; scales: 0.25 mm.)

Neoscona scylla (Karsch, 1879)
(Figs. 70–75, 76–82, 86)

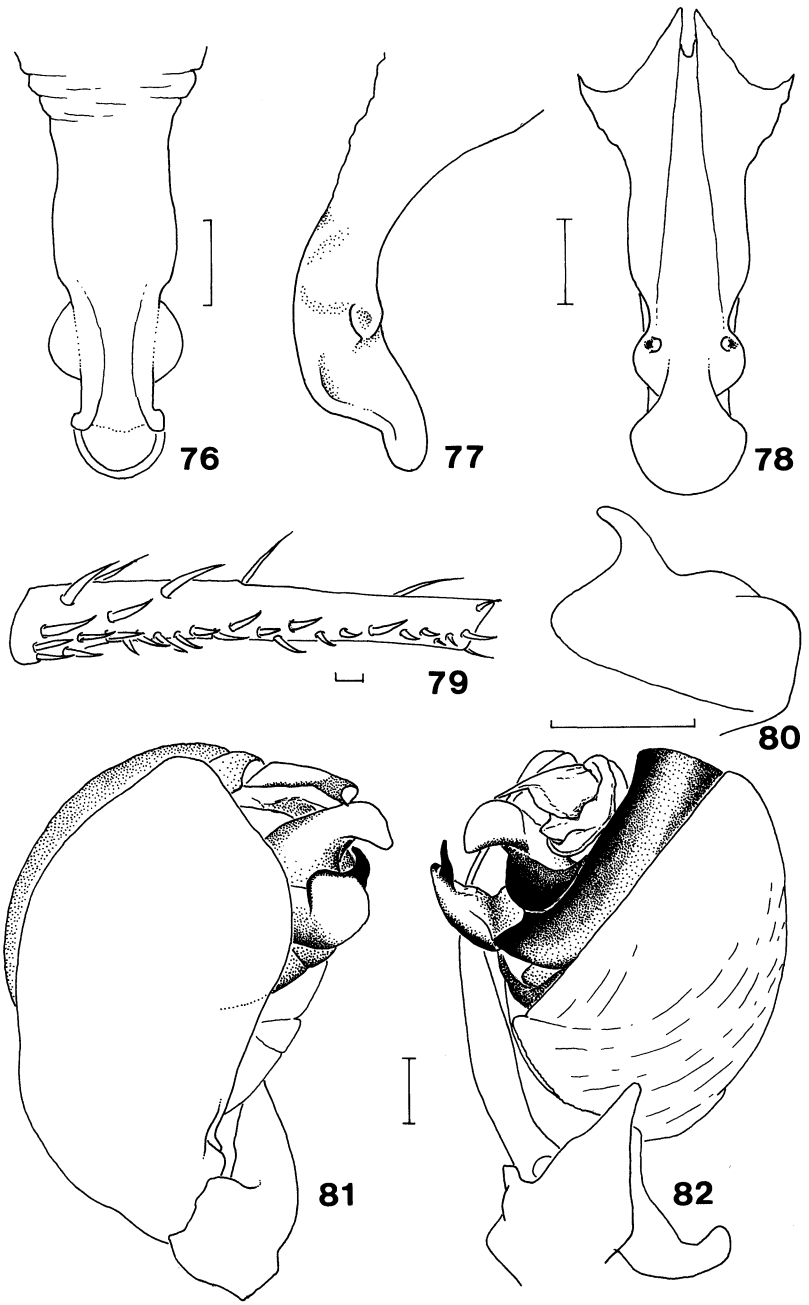
Epeira scylla Karsch, 1879, p. 71. (Female holotype from Japan, not examined.)
Aranea scylla: Bösenberg & Strand, 1906, p. 215, taf. 11, figs. 202, 220.
Araneus scyllus: S. Saito, 1939, p. 20, fig. 3-3; S. Saito, 1959, p. 89, pl. 12, fig. 101, pl. 13, fig. 101.
Neoscona scylla: Yaginuma, 1955, p.18, pl. 1, figs. 9, 16; Yaginuma, 1960, p. 56, fig. 52-2, pl. 21, fig. 124; Yaginuma, 1968, p. 56, fig. 52-2, pl. 21, fig. 124; Yaginuma, 1986a, p. 103, fig. 55-5, pl. 25, fig. 1.



Figs. 69. The localities of the specimens examined in this study. ○: *Neoscona scylloides* (Bösenberg et Strand, 1906), ●: *Neoscona mellotteei* (Simon, 1895).

Specimens examined. Specimens measured. 1 ♂, Maruyama, Sapporo-shi, Hokkaido, 14-VIII-1981, S. Nakano leg. (NSMT-Ar 4118); 1 ♀ 1 ♂, Kotokuji, Itsukaichi-shi, Tokyo, 27-VII-1983, K. Kumada leg. (NSMT-Ar 4119); 1 ♀, Noba-cho, Yokohama-shi, Kanagawa Pref., 20-IX-1979, H. Iijima leg. (NSMT-Ar 4120); 1 ♀,

Figs. 70-75. *Neoscona scylla* (Karsch, 1879).



Figs. 76–82. *Neoscona scylla* (Karsch, 1879) —— 76, Epigynum, ventral view; 77, same, lateral view; 78, same, dorsal view; 79, male left tibia II, prolateral view; 80, median apophysis of male left palp, lateral view; 81, male left palp, ventral view; 82, same, dorsal view. (Female and male: NSMT-Ar 4119; scales: 0.25 mm.)

Shonandaira, Naka-gun, Kanagawa Pref., 13-VI-1982, A. Tanikawa leg. (NSMT-Ar 4121); 1 ♂, Iriuda, Odawara-shi, Kanagawa Pref., 27-VI-1996, N. Tanaka leg. (NSMT-Ar 4122); 1 ♂, Nachikatsuura-cho, Higashimuro-gun, Wakayama Pref., 22-VII-1993, A. Tanikawa leg. (NSMT-Ar 4123); 1 ♀, Kami-achi, Okayama-shi, Okayama Pref., 25-VIII-1991, A. Tanikawa leg. (NSMT-Ar 4124); 1 ♀, Mt. Azumayama, Hiba-gun, Hiroshima Pref., 12-VII-1974, M. Kuya leg., (NSMT-Ar 4125); 1 ♀, Miyanoura, Yakushima Is., Kagoshima Pref., 15-VII-1990, A. Tanikawa leg. (NSMT-Ar 4126); 1 ♂, Nangusuku-Nakagusuku, Okinawajima Is., Okinawa Pref., 6-8-VI-1997, A. Shinkai leg. (NSMT-Ar 4127).

Other specimens examined. 58 ♀ 23 ♂ from Hokkaido, Akita, Miyagi, Ibaraki, Tochigi, Saitama, Chiba, Tokyo, Kanagawa, Nagano, Shizuoka, Nara, Wakayama, Mie, Okayama, Hiroshima, Ehime, Oita, Miyazaki, Kagoshima (including Yakushima Is. and Amami-oshima Is.), Okinawa (Okinawajims Is. and Iriomotejima Is.) Prefectures.

Description. Measurement. Total L ♀ 9.10-15.88, ♂ 6.85-11.56; carapace L ♀ 4.30-6.81, ♂ 3.76-6.13; W ♀ 3.50-5.85, ♂ 3.14-5.07; abdomen L ♀ 5.53-9.10, ♂ 3.68-6.46; width ♀ 4.88-8.80, ♂ 2.66-4.35. Leg L [1 ♀ from Kagoshima Pref. (NSMT-Ar 4126) / 1 ♂ from Tokyo (NSMT-Ar 4119)]: I, 18.06/21.67, II, 16.77/17.97, III, 10.24/13.17, IV, 16.39/20.75.

Female and male. Carapace L/W ♀ 1.16-1.23, ♂ 1.18-1.23; MOA L/W ♀ 0.89-1.00, ♂ 0.86-0.95; WA/WP ♀ 1.19-1.28, ♂ 1.14-1.35; labium L/W ♀ 0.72-0.84, ♂ 0.77-0.87; sternum L/W ♀ 1.12-1.17, ♂ 1.30-1.54; leg I L/carapace L ♀ 3.57-3.82, ♂ 3.72-3.81; male coxa IV without hook. Male palp (Figs. 80-82): median apophysis with hook at distal half. Abdomen L/W ♀ 1.03-1.24, ♂ 1.32-1.49; epigynum long and narrow (Figs. 76-78).

Coloration and markings. Much varied as in Figs. 70-75. Carapace pale brown to brown, with dark colored border in male. Abdomen pale brown, brown, or dark brown, usually with folium, sometimes with black marking or white marking.

Range. East Asia (Japan, China, Korea, Taiwan).

Remarks. N. scylla resembles *N. minoriscylla* in general appearance, but it can be easily distinguished from the latter by the shape of epigynum; epigynum of *N. scylla* is entirely narrow (Figs. 76-78) while that of *N. minoriscylla* is very wide at base (Figs. 83-85).

Neoscona minoriscylla Yin *et al.*, 1990
(Figs. 83-85, 86, 87)

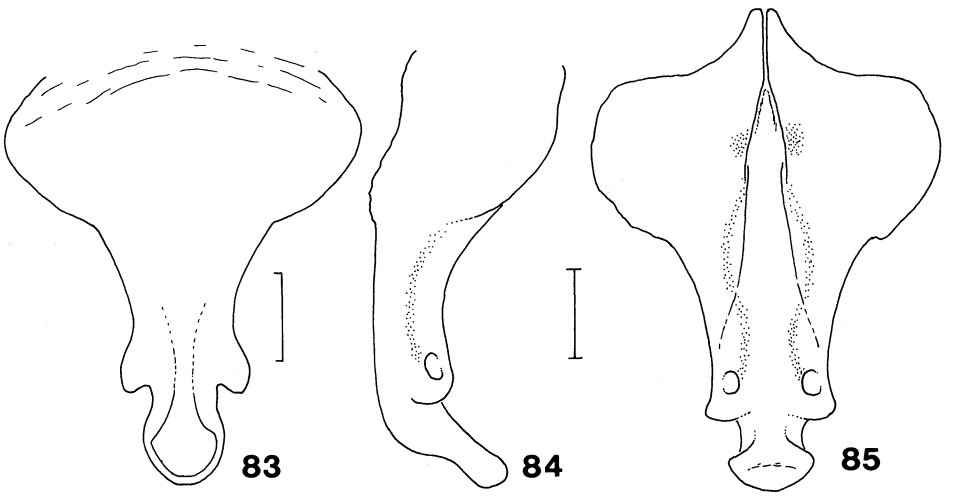
Neoscona minoriscylla Yin *et al.*, 1990, pp. 123, 166, figs. 301-309. (Female holotype from Changsha City, Hunan Province, China, not available.); Yin *et al.*, 1997, p. 367.

Specimens examined. Specimen measured. 1 ♀, Kamitsushima-cho, Tsushima Is., Nagasaki Pref., 3-VIII-1996, A. Yasuda leg. (NSMT-Ar 4128).

Other specimens examined. China: 1 ♀, Dongan County, Fujian Province, 22-VII-1986, Yin C. leg.; 1 ♀, Juining County, Hunan Province, VIII-1984, Zhang Y. leg.

Description. Measurement. Total L ♀ 9.90; carapace L ♀ 3.88; W ♀ 3.08; abdomen L ♀ 6.00; W ♀ 5.40. Leg L [1 ♀ from Nagasaki Pref. (NSMT-Ar 4128)]: I, 14.51, II, 13.35, III, 7.93, IV, 13.60.

Female and male. Carapace L/W ♀ 1.26; MOA L/W ♀ 0.97; WA/WP ♀ 1.30;



Figs. 83–85. *Neoscona minoriscylla* Yin *et al.*, 1990. —— 83, Epigynum, ventral view; 84, same, lateral view; 85, same, dorsal view. (NSMT-Ar 4128; scales: 0.25 mm.)

labium L/W ♀ 0.74; sternum L/W ♀ 1.18; leg I L/carapace L ♀ 3.74. Abdomen L/W ♀ 1.11; epigynum very wide at base (Figs. 83, 85).

Coloration and markings. As in Fig. 87. Carapace pale brown, anteriorly darker. Abdomen brown, with folium.

Range. East Asia [Japan (Tsushima Is.), China].

Remarks. N. minoriscylla resembles *N. scylla* in general appearance. As for the discriminating point, see the remarks of *N. scylla*.

Neoscona punctigera (Doleschall, 1857)
(Figs. 88–90, 93–99, 107)

Epeira punctigera Doleschall, 1857, p. 420. (Type from Amboina, not examined.)
Epeira opima Koch, 1878, p. 740, taf. 15, fig. 3. (Type from Japan, not examined.)
Aranea punctigera vatia: Bösenberg & Strand, 1906, p. 230, taf. 11, fig. 206.
Aranea opima: Bösenberg & Strand, 1906, p. 231, taf. 11, fig. 221.
Neoscona opima: Yaginuma, 1955, p. 19, pl. 1, figs. 8, 12.
Araneus opimus: Yaginuma, 1960, p. 53, fig. 50, pl. 18, fig. 111.
Araneus lugubris: Chrysanthus, 1960, p. 36, figs. 39–42, 45, 69; Yaginuma, 1967, p. 89, figs. 1e, 1f; Yaginuma, 1968, p. 53, fig. 50, pl. 18, fig. 111. [Nec *Epeira lugubris* Walckenaer, 1841 = *Neoscona triangula* (Keyserling, 1864).]
Afraranea punctigera: Grasshoff, 1980, p. 403, figs. 5–7.
Neoscona lugubris: Tikader, 1982, p. 255, figs. 506–509. [Nec *Epeira lugubris* Walckenaer, 1841 = *Neoscona triangula* (Keyserling, 1864).]
Neoscona punctigera: Roberts, 1983, p. 275, figs. 205–208; Grasshoff, 1986, p. 117.
Araneus punctigera: Yaginuma, 1986a, p. 98, fig. 52-1, pl. 22, fig. 4.

Specimens examined. Specimens measured. 1 ♀, Tsukuba-shi, Ibaraki Pref., 15-

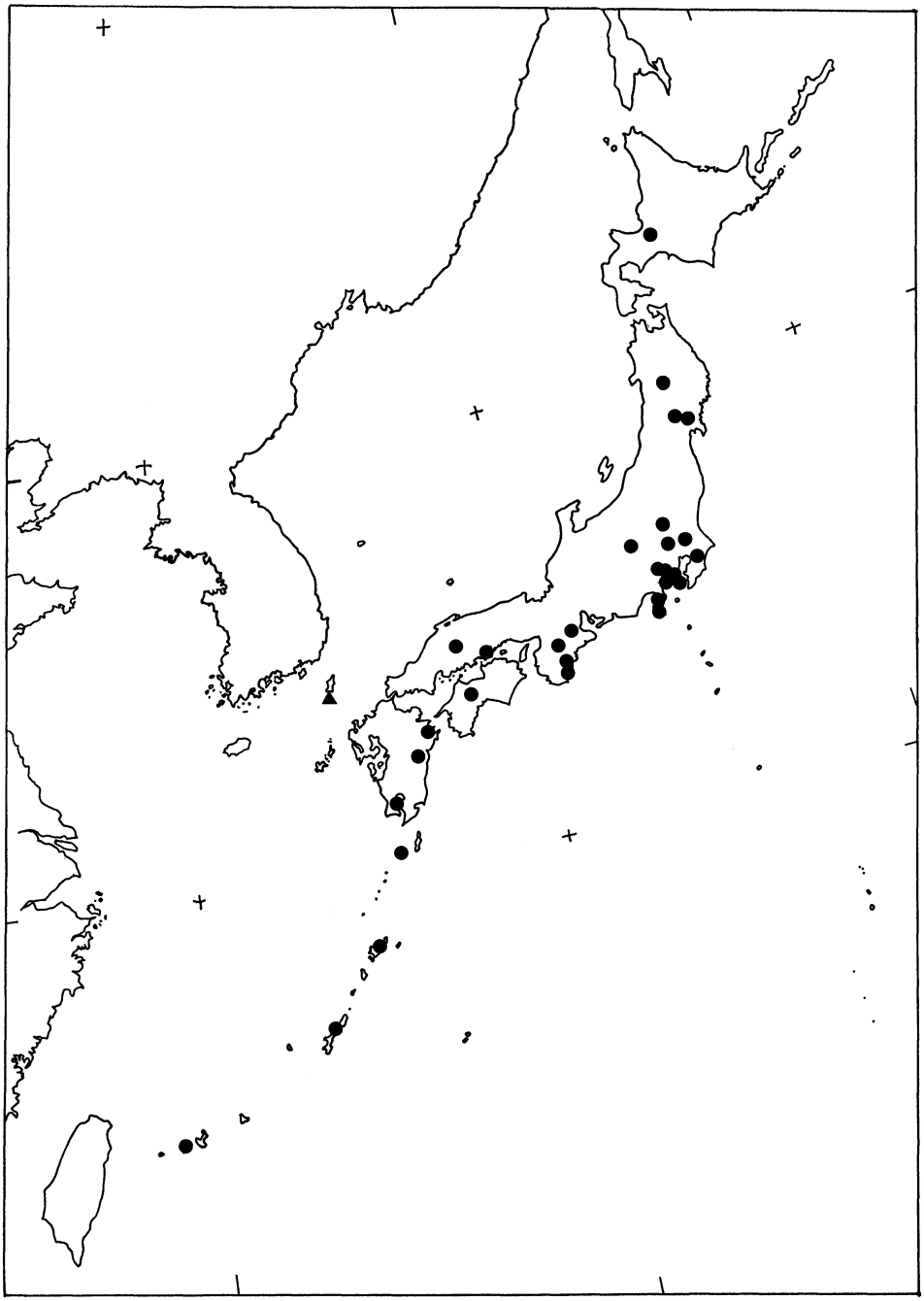
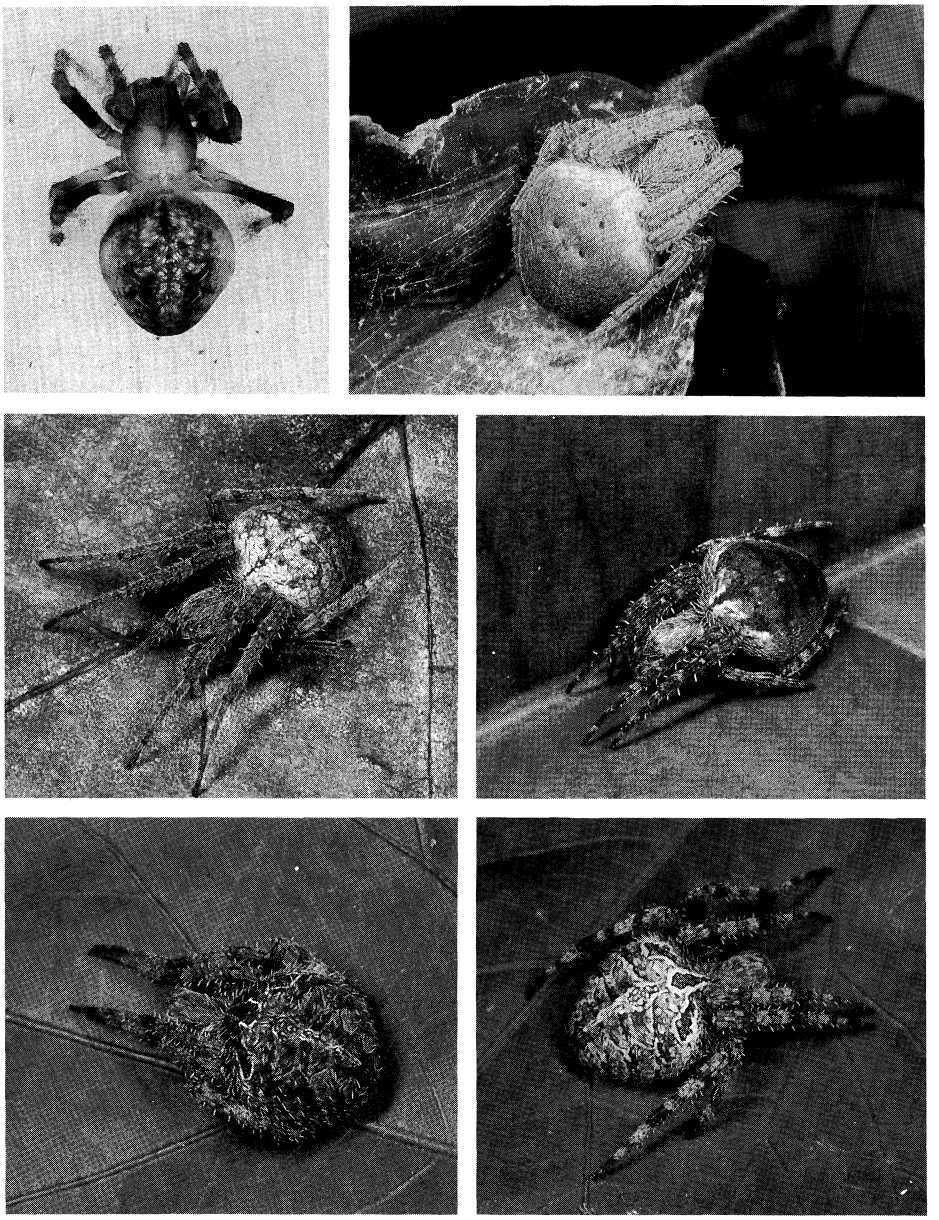
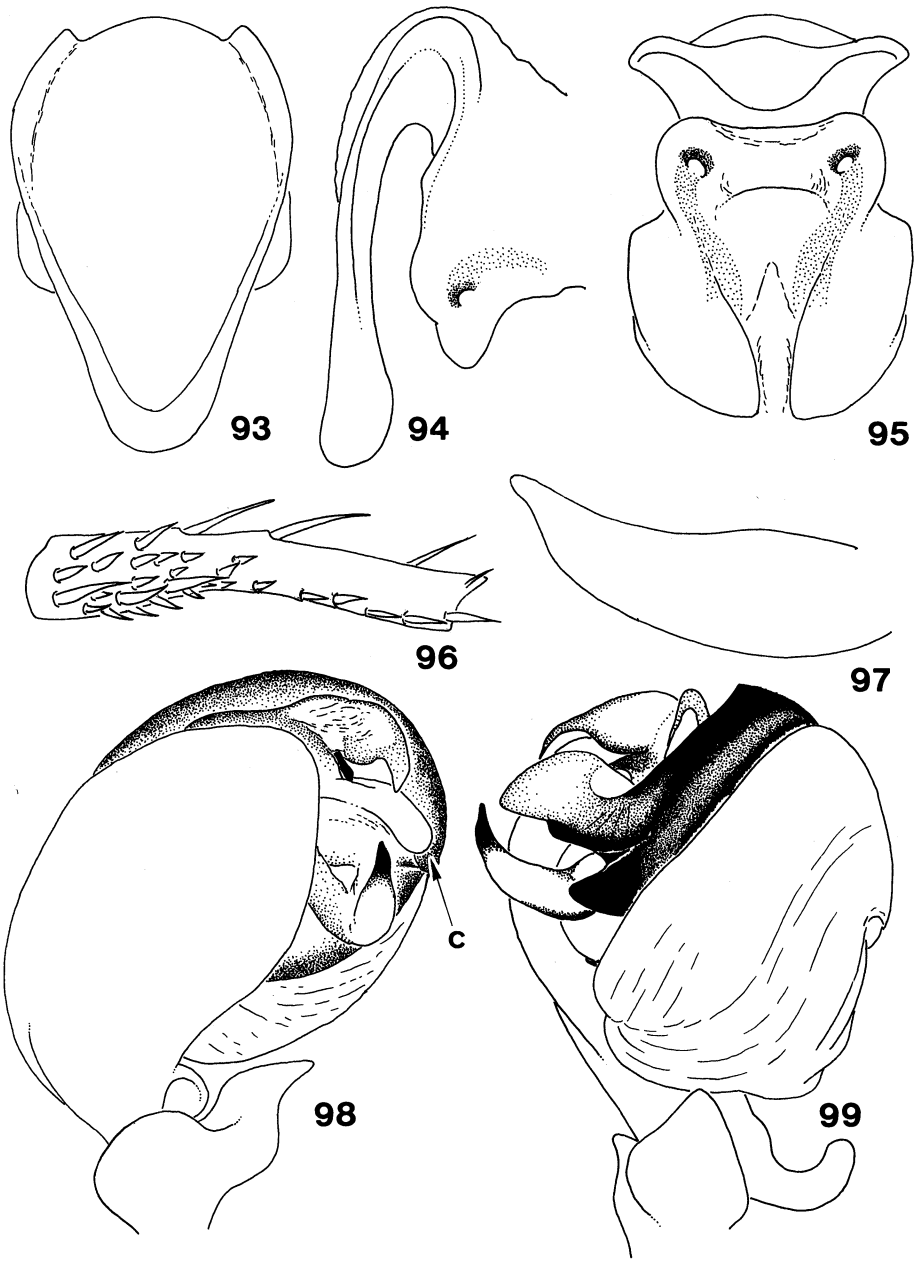


Fig. 86. The localities of the specimens examined in this study. ●: *Neoscona scylla* (Karsch, 1879), ▲: *Neoscona minoriscylla* Yin *et al.*, 1990



Figs. 87–92. 87 (Top left), *Neoscona minoriscylla* Yin *et al.*, 1990; 88–90 (top right, middle), *Neoscona punctigera* (Doreschall, 1857); 91–92 (bottom), *Neoscona vigilans* (Blackwall, 1865).



Figs. 93-99. *Neoscona punctigera* (Doleschall, 1857) —— 93, Epigynum, ventral view; 94, same, lateral view; 95, same, posterior view; 96, male left tibia II, prolateral view; 97, median apophysis of male left palp, lateral view; 98, male left palp, ventral view (c: conductor); 99, same, dorsal view. (Female: NSMT-Ar 4134, male: NSMT -Ar 4133, scales: 0.25 mm.)

IX-1975, T. Takai leg. (NSMT-Ar 4129); 1 ♀, Shiroyama-cho, Tsukui-gun, Kanagawa Pref., 30-IX-1980, A. Tanikawa leg. (NSMT-Ar 4130); 1 ♀, Mt. Koboyama, Hadano-shi, Kanagawa Pref., 3-V-1983, K. Sato leg. (NSMT-Ar 4131); 1 ♂, Washio, Kosai-shi, Shizuoka Pref., 25-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4132); 1 ♂, Shirahama-cho, Nishimuro-gun, Wakayama Pref., 22-VIII-1993, A. Tanikawa leg. (NSMT-Ar 4133); 1 ♀, Nachikatsuura-cho, Higashimuro-gun, Wakayama Pref., 30-VIII-1990, A. Tanikawa leg. (NSMT-Ar 4134); 1 ♀, Kokubunji-cho, Ayauta-gun, Kagawa Pref., 3-X-1990, A. Tanikawa leg. (NSMT-Ar 4135); 1 ♂, Urauchi, 28-XII-1986 (NSMT-Ar 4136); 1 ♂, Sonai, 25-XII-1989 (NSMT-Ar 4137), 1 ♀, Otomi, 30-III-1994 (NSMT-Ar 4138), 1 ♂, Komi, 27-III-1995 (NSMT-Ar 4139), Iriomotejima Is., Okinawa Pref., A. Tanikawa leg.

Other specimens examined. 27 ♀ 10 ♂ from Ibaraki, Tokyo, Kanagawa, Shizuoka, Aichi, Mie, Wakayama, Tottori, Okayama, Kagawa, Kagoshima, Okinawa (Okinawa-jima Is., Ishigakijima Is., Iriomotejima Is., and Yonagunijima Is.) Prefectures.

Description. Measurement. Total L ♀ 8.40-16.13, ♂ 6.77-8.90; carapace L ♀ 4.30-6.00, ♂ 3.85-4.86; W ♀ 3.50-5.20, ♂ 3.10-4.00; abdomen L ♀ 5.60-10.13, ♂ 3.52-4.85; width ♀ 4.40-10.56, ♂ 2.92-4.30. Leg L [1 ♀ from Kanagawa Pref. (NSMT-Ar 4131) / 1 ♂ from Okinawa Pref. (NSMT-Ar 4139)]: I, 17.97/14.85, II, 17.22/12.93, III, 10.76/7.88, IV, 15.88/11.96.

Female and male. Carapace L/W ♀ 1.15-1.23, ♂ 1.20-1.25; MOA L/W ♀ 0.85-0.93, ♂ 0.78-1.00; WA/WP ♀ 1.33-1.48, ♂ 1.43-1.48; labium L/W ♀ 0.73-0.80, ♂ 0.82-0.96; sternum L/W ♀ 1.10-1.17, ♂ 1.35-1.45; leg I L/carapace L ♀ 3.21-3.87, ♂ 3.44-3.83; male coxa IV without hook. Male palp (Figs. 97-99): median apophysis without hook (Fig. 97). Abdomen L/W ♀ 0.96-1.27, ♂ 1.01-1.21; epigynum tongue shaped (Fig. 93).

Coloration and markings. As in Figs. 88-90. Carapace brown or reddish brown, with dark colored border in male. Abdomen pale brown, reddish brown, brown, or dark brown, sometimes with dark colored marking.

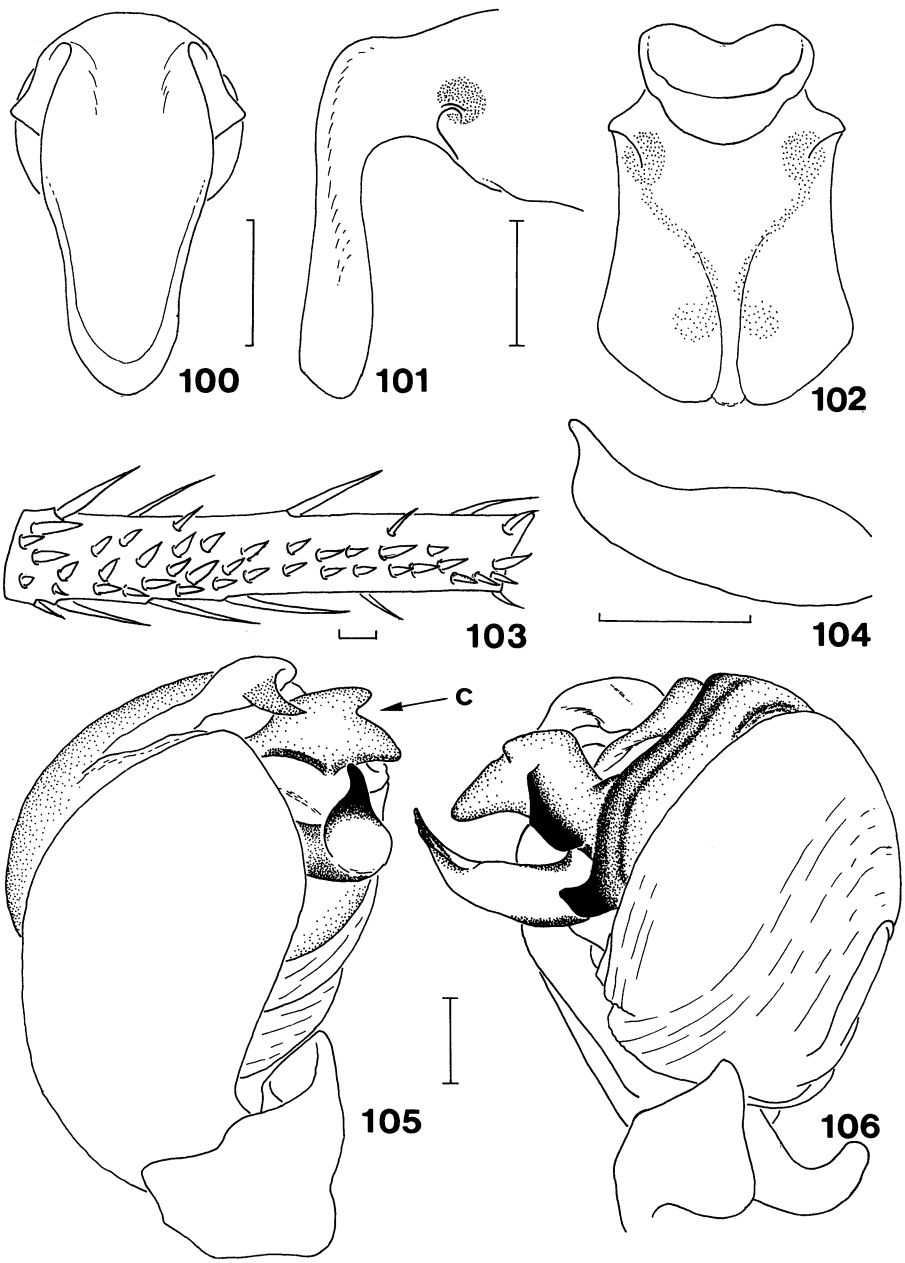
Range. From Seychelles to East Asia (Japan, China, Korea, Taiwan), New Guinea.

Remarks. N. punctigera resembles *N. vigilans* in general appearance, but it can be easily separated from the latter by the following points. In female, they can be separated by the lateral view of the epigynum (Figs. 94, 101). In male, palpal conductor of *N. vigilans* is distally bifurcated (Fig. 105, c) while not in *N. punctigera* (Fig. 98, c).

Neoscona vigilans (Blackwall, 1865)
(Figs.91-92, 100-107)

Epeira vigilans Blackwall, 1865, p. 342. (Syntypes from Malawi, Africa, preserved in Oxford University Museum, not examined.)
Epeira rufofemorata Simon, 1884, P. 348, fig. 6.
Araneus alternidens Schenkel, 1936, p. 107, fig. 38.
Neoscona rumpfi: Yaginuma, 1955, p. 19, pl. 1, fig. 7.
Araneus rufofemoratus: Chrysanthus, 1960, p. 33, figs. 35-38, 43, 70; Yaginuma, 1986a, p. 101.
Neoscona vigilans: Grasshoff, 1986, p. 95, figs. 141-145.

Specimens examined. Specimens measured. 2 ♀, Sumiyo, 29 - XII - 1995



Figs. 100–106. *Neoscona vigilans* (Blackwall, 1865). —— 100, Epigynum, ventral view; 101, same, lateral view; 102, same, posterior view; 103, male left tibia II, prolateral view; 104, median apophysis of male left palp, lateral view; 105, male left palp, ventral view (c: conductor); 106, same, dorsal view. (Female: NSMT-Ar 4140, male: NSMT-Ar 4141; scales: 0.25 mm.)

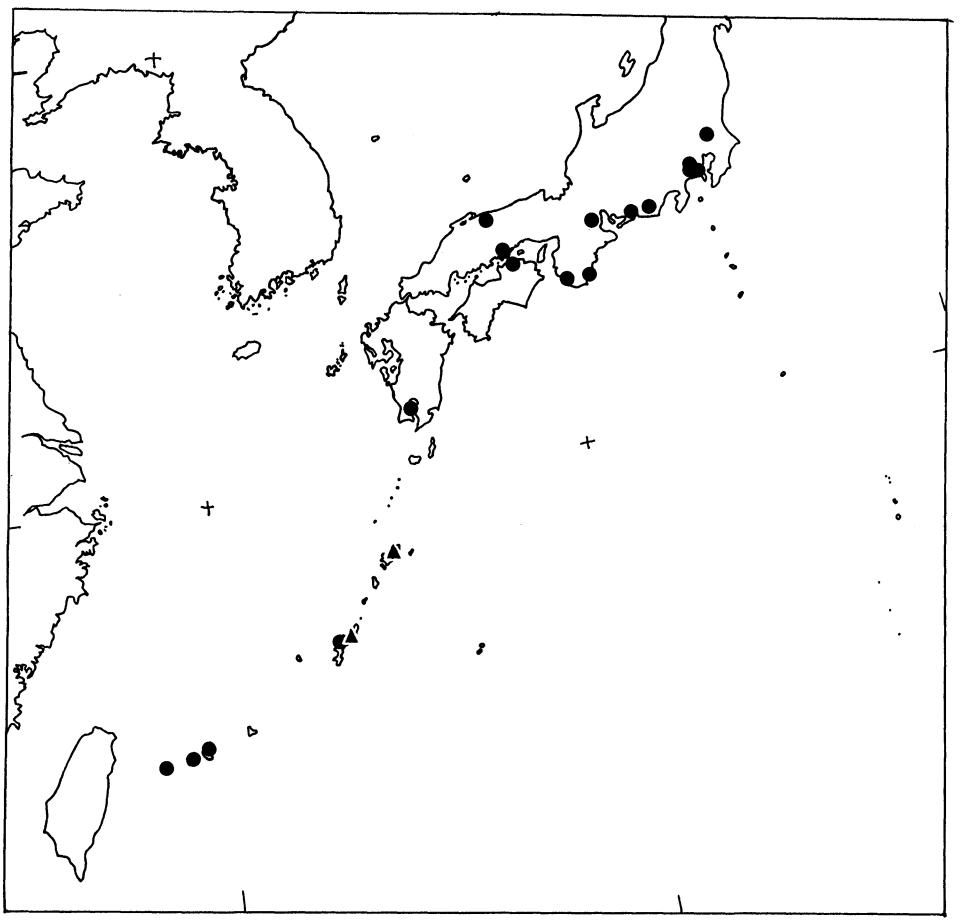


Fig. 107. The localities of the specimens examines in this study. ●: *Neoscona punctigera* (Doreschall, 1857), ▲: *Neoscona vigilans* (Blackwall, 1865).

(NSMT- Ar 4140), 1 ♂, 25-VIII-1989 (NSMT-Ar 4141), 1 ♀, 26-VIII-1989 (NSMT-Ar 4142), Ichi, Amami-oshima Is., Kagoshima Pref., A. Tanikawa leg.; 1 ♀, Yona, 12 -VIII-1998, A. Tanikawa leg. (NSMT-Ar 4143), 1 ♂, 2-IV-1997 (subadult, 30-IV adult after breeding), T. Kuwae leg. (NSMT-Ar 4144), 1 ♂, 22-VIII-1997, T. Sasaki leg. (NSMT- Ar 4145), Kijoka, Okinawajima Is., Okinawa Pref.

Other specimens examined. Japan: 2 ♀ from Okinawajima Is. and Amami-oshima Is. Bhutan: 1 ♀ from Refe near Tongsa.

Description. Measurement. Total L ♀ 9.50-16.88, ♂ 7.80-9.00; carapace L ♀ 4.10- 7.00, ♂ 4.35-5.33; W ♀ 3.20-5.75, ♂ 3.55-4.22; abdomen L ♀ 6.40-10.31, ♂ 4.00- 4.35; width ♀ 5.27-10.88, ♂ 3.24-3.75. Leg L [1 ♀ (NSMT-Ar 4140) / 1 ♂ (NSMT- Ar 4141) from Amami-oshima Is., Kagoshima Pref.]: I, 13.78/16.79, II, 13.16/ 14.93, III, 8.24/9.59, IV, 12.48/14.64.

Female and male. Carapace L/W ♀ 1.19-1.29, ♂ 1.23-1.26; MOA L/W ♀ 0.90-

0.97, ♂ 0.92–0.98; WA/WP ♀ 1.26–1.43, ♂ 1.24–1.53; labium L/W ♀ 0.77–0.82, ♂ 0.84–0.93; sternum L/W ♀ 1.09–1.17, ♂ 1.26–1.46; leg I L/carapace L ♀ 3.13–3.49, ♂ 3.15–3.37; male coxa IV without hook. Male palp (Figs. 104–106): median apophysis without hook (Fig. 104); tip of conductor bifurcated (Fig. 105, c). Abdomen L/W ♀ 0.93–1.22, ♂ 1.16–1.25; epigynum tongue shaped (Fig. 100).

Coloration and markings. As in Figs. 91–92. Carapace brown or reddish brown, with dark colored border. Abdomen brown or dark brown, with light colored marking.

Range. Wide spread in old world tropical region and New Guinea.

Remarks. N. vigilans resembles *N. punctigera* in general appearance. As for the discriminating point, see remarks of *N. punctigera*.

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摘　　要

日本各地から得られた多数の標本を検討した結果，11種の *Neoscona* 属クモ類の生息を確認した．*N. theisi* (Walckenaer, 1841) ホシスジオニグモ，*Neoscona adianta* (Walckenaer, 1802) ドヨウオニグモ，*N. nautica* (L. Koch, 1875) イエオニグモ，*N. subpullata* (Bösenberg et Strand, 1906) ヘリジロオニグモ，*N. mellotteei* (Simon, 1895) ワキグロサツマノミダマシ，*N. scylloides* (Bösenberg et Strand, 1906) サツマノミダマシ，*N. scylla* (Karsch, 1879) ヤマシロオニグモの7種が現在まで日本産の *Neoscona* 属のクモ類として認識されていた．これらの種について再検討の結果，全て *Neoscona* 属に所属させるべきものであることを再確認した．*N. punctigera* (Doleschall, 1857) コゲチャオニグモと *N. vigilans* (Blackwall, 1865) アカアシオニグモについては，*Afraranea* 属として扱われたり，*Araneus* 属に残されたりしてきたが，検討の結果，*Afraranea* 属は *Neoscona* 属の新参シノニムとして扱うことが妥当であるとの結論に達したので，この2種をあらためて *Neoscona* 属として扱った．対馬から得られた標本は中国から記載された *N. minoriscylla* Yin *et al*., 1990 ヤスダオニグモ（新称）であることを確認した．また，奄美大島から得られた1新種を *N. amamiensis* アマミオニグモと命名して記載した．

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